UNIFORM TYPE COMMITTEE

REPORT    -- 1915
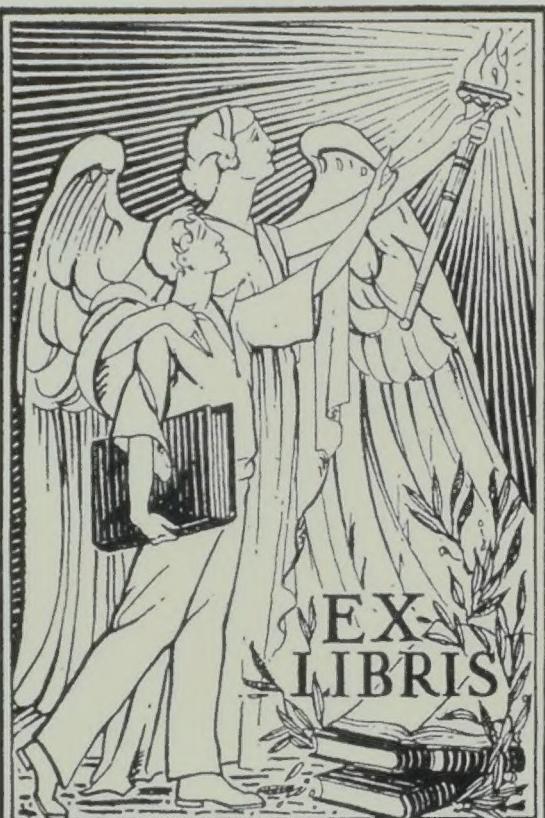
# FIFTH BIENNIAL REPORT

of the

# UNIFORM TYPE COMMITTEE

of the

## American Association of Workers for the Blind

with an Exhibit of the

## STANDARD DOT SYSTEM

Recommended for Adoption
at the

## Convention of Workers for the Blind
at Berkeley, California

1915

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# GLOSSARY

BASE, VARIABLE. This term is used to designate the plan by which the horizontal space allotted to each character varies with the width of the character, as in the New York Point.

BASE, First, Second, Third, etc. A first-base character is one having a dot or dots in the first vertical column only. A second-base character has dots in the first and second vertical columns only. Third-base characters, fourth-base characters, etc., may be similarly defined.

BLOCK SPACING. This is a term used to describe the plan of allotting a fixed amount of space to each character (including the following letter-space) without regard to the relative size of characters, as in the common Braille tablet work.

CHARACTER. In dot systems, a dot or group of dots used as a single sign.

CHARACTERS, Equivocal or Positional. These terms have been used to designate certain characters which differ only as to their position in the line, upper, lower, or middle. When in the lower or middle position, they are called LOW–LEVEL CHARACTERS.
First, second, and third-base characters are defined under "Base."

CLOSE BRAILLE is Braille in which the space allotted to the first-base characters (including the following letter-space) is less than that allotted to the second-base characters (including their letter-space). Much of the close Braille now being printed is Braille with New York intervals, but some is printed with shorter intervals.

The term "CONTRACTION SIGN" or "CONTRACTION" is used to designate a sign standing for two or more letters.

TWO-CELL CONTRACTION. In some cases, a character in British Braille immediately preceded by one of the characters formed in the second column of the Braille 2 x 3 area is used to represent a group of letters, thus using two cells for one contraction.

By "DIACRITICAL NOTATION" or marking is herein meant any specific representation of an accented or otherwise modified letter or group of letters employed, with special indices affixed, in pronouncing vocabularies, and in English or other literary expression; e. g., the macron, the breve, the diaeresis, the acute, grave and circumflex accents, the cedilla, the tilde, etc.

DOTS, METHOD OF DESIGNATING. The method adopted for designating dots by number is as follows: The dots in the first vertical column are designated 1, 2, and 3; those in the second column 4, 5, and 6; those in the third column 7, 8, and 9; in each case counting from top to bottom; and characters are designated by their dot numbers.

ELDRIDGE LIST. Mr. R. C. Eldridge of Niagara Falls, New York, in making some investigations to further a plan for a universal language, counted the words in matter aggregating nearly forty-four thousand words, exclusive of proper names and numerals. Our Construction Agent has used the same matter and has counted some details, such as letters, capital letters, figures and letter groups, not included in Mr. Eldridge's count.

INTERLINING AND INTERPOINTING. These methods of writing use both sides of the sheet. In interlining, the lines on one side of the paper come in the spaces between the lines on the other. In interpointing, the dots on one side come in the spaces between the dots on the other.

INTERVAL, NEW YORK, or NEW YORK POINT INTERVALS. The variable base with a one-point space between letters has been used for many years in New York Point. Hence, when Braille is written with the same spacing, it is commonly known as Braille with New York Point intervals.

LEGIBILITY. The speed and certainty with which characters can be recognized and distinguished from their associates.

LETTER–GROUP. Any sequence of letters found in words. In our counts only those within the limits of a syllable are noted.

LETTER–SPACE. This is the blank space between the characters within a word. In New York Point this is equal to the horizontal space occupied by one dot. In Braille it varies, but has commonly been somewhat less than the width of one dot.

LINE, TWO–LEVEL, is the plan in which all the dots are on an upper and a lower line, as in New York Point.

LINE, THREE–LEVEL, is the plan in which dots appear on three lines, upper, lower and middle.

POINT is sometimes used to mean an embossed dot. POINT or POINT UNIT is also used to mean the space which is or might be occupied by one dot. Its length and width are equal to the space between two dots in adjacent positions, center to center.

RECURRENCE, NON–CONFLICTING. In systems where letter-groups are expressed by special signs, the recurrence of letters as such is thereby diminished, and the recurrence of a group may be diminished by being part of another group, as *on* in *tion*; or by its being broken up by overlapping with a preferred group, as *is* and *st* in *ist*, where either the sign for *is* or that for *st* may be used, but not both. The non-conflicting recurrence of a letter or group is what remains after deducting from its total recurrence all the recurrences lost in other groups.

SCALE OF TYPE means size of type.

TIME, LETTER. Most Braille characters and many New York Point characters were tested on sheets where the characters appeared in groups like words and were read letter by letter. The times taken to read a given number of each letter were proportioned to a common base taken as one hundred and the resulting numbers are referred to as letter-time. In the case of some characters which are not used as letters, letter-time was estimated from that of similar characters which are used as letters.

TIME, WORD. Many characters were tested in their use as whole-word signs and the time results proportioned to a common base are referred to as word-time.

VALUES, ACCURACY. The computed values of the various characters in regard to accuracy, based upon the relative accuracy with which they were read in the tests.

VALUE, DERIVED. The average of the letter-value and the word-value. (Where a character appears as a letter in more than one system or as a word in more than one system, the average letter-value is averaged with the average word-value to obtain the derived-value.)

VALUE, ERROR. The percentage of error based on the number of times the character was read.

VALUE, LEGIBILITY. Value in which speed and accuracy are combined.

VALUE, LETTER. The value of a character when used as one of a group, for example, letters and part-word signs.

VALUE, TIME. A number representing the time in which a character was read, proportioned to a common base taken as one hundred.

VALUE, WORD. The value which a character has when used standing by itself for a whole word.

# SALUTATION

## TO THE AMERICAN ASSOCIATION OF WORKERS FOR THE BLIND:

*Mr. President, Ladies and Gentlemen,—*

Your Committee begs to submit herewith its Fifth Biennial Report covering the period of two years ending July, 1915, and asks to be discharged. We wish to again go on record as expressing our deep appreciation of the sympathetic interest and practical co-operation of the many friends of the cause who have cordially supported the committee in its work. It would be impossible, even if appropriate, to enumerate the names of all of those who have been of practical assistance, or the many ways in which their help has been rendered, but in particular, mention should be made of the services of Mr. M. C. Migel, Chairman of the Special Committee appointed to raise funds for the work of the Uniform Type Committee; of Mr. George R. Bellows, who has gratuitously served almost the entire term as successor to the late William C. Sherlock as treasurer of the committee, and of Mrs. Elwyn H. Fowler in the capacity of clerk and amanuensis to the committee, whose great fund of technical knowledge and expert experience in connection with the type question has placed at our disposal a resource, the value of which cannot be expressed in dollars and cents.

## HISTORICAL REVIEW

### (A) Prior to the Beginning of the Present Term of the Committee's Services

In presenting this final Report it would seem particularly appropriate that a thorough review of the whole question of embossed type, as well as of the work of this committee, should be presented; but as the ground has been thoroughly gone over in each preceding Report up to the date of its presentation, and as the present Report must necessarily contain voluminous appendices covering work done during the past two years, it has seemed to the committee that cross references to earlier Reports rather than a re-statement of matter already in print would be sufficient. We, therefore, refer you to our Reports on file with the secretary presented respectively in 1907, 1909, 1911 and 1913, for tables showing the results of our investigations and statements of our procedure, but in particular to page 8, 1909, ("Comparison of Ease and Accuracy in Writing with Few and Many Dot Characters"); page 2, 1911, ("Report of Investigating Subcommittee"); page 5, 1911 ("Experiments Relative to Legibility"); page 6, 1911, ("Experiments with Vertical and Horizontal Characters"); page 3, 1913, ("Historical Outline of the Type Question"); page 4, 1913, ("Original Instructions"); page 9, 1913, ("Results of Investigations"); pages 10 to 22, inclusive, 1913, ("Showing Experiments Devised to Bring Out Various Essential Features"); page 23, 1913, ("Conclusions"); page 24, 1913, ("Recommendations"); Appendix E, 1913 ("Complete Set of Test Sheets used in 1912 and 1913).

### (B) General Review of Work Since Last Report

After appointment by the President of the Association at the Jacksonville Convention, 1913, the members of the Uniform Type Committee organized as follows:

#### Officers

Charles W. Holmes, Chairman.
Elwyn H. Fowler, Secretary.
H. Randolph Latimer, Construction Agent.

#### Sub-Committees

*Executive*—Messrs. Holmes, Fowler, Latimer.
*Investigating*—Mr. Fowler, Misses Hicks and Howard.
*Publicity*—Messrs. Fowler and Holmes.
*Apparatus*—Mr. Nolan.
*Treasurer*—William C. Sherlock, whose lamented death shortly deprived both the association and the committee of his valued services; succeeded by George R. Bellows.
*Committee Clerk and Amanuensis*—Mrs. E. H. Fowler; (the last two workers being non-members of the committee).

Some preliminary work was done by the committee in advance of action by the Finance Committee appointed to raise funds for the work, and when the latter was in position to defray expenses, much more active work was begun. Miss Howard was chosen by the committee as field-worker to prosecute further the labor of conducting tests devised to gather facts on various necessary points, similar to the work which she had already done extensively and acceptably for the committee. Accompanied by an amanuensis, Miss Howard visited several schools and centers in this country, Canada and England, incidentally attending the London Conference on the Blind, June, 1914.

The Construction Agent has utilized in the development of the Standard Dot System presented herewith the results of the findings made under the direction of the Investigating Subcommittee, both in former terms and during the present term, and also upon counts of recurrence of words, letters and letter-groups, etc., made by Mr. R. C. Eldridge of Niagara Falls, N. Y., which was held to be as satisfactory a starting point for such data as was available, and sufficiently so for the purpose. In the prosecution of this work Mr. Latimer has shown great capacity and thoroughness, and in presenting same we are confident that it forms a safe and sound basis for the conclusions drawn from it. Mr. Latimer was selected by the Committee as official delegate to the London Conference, and following the request of members of the Conference Committee that we should have a larger representation, Mr. Fowler was also asked to be present.

Several other members of this Association intimately familiar with the work of the Type Committee were also in attendance. Our delegates were most cordially received by workers for the blind in Great Britain, who have since appointed a committee of ten to receive and consider our report and findings, looking forward to the much desired possibility of the adoption of the Standard Dot System abroad, or at least to some basis upon which we may agree to the end of making the interchange of literature and correspondence practicable. The Publicity Subcommittee has from time to time furnished texts for press notices, conducted an active correspondence, and in particular has gotten out a little pamphlet outlining the purposes and plans of the Committee, copies of which may be had on application to the secretary, and a reprint of which has appeared in some of the English magazines. The sub-committee on apparatus has negotiated for the manufacture of writers and tablets upon which the Standard Dot System on the three-level variable-base principle can be written, and has arranged with the Cooper Manufacturing Company, 558 West Washington Boulevard, Chicago, to supply such tablets at not more than $1.00 apiece, while the ordinary New York Point rack, with an improved selective escapement makes it possible to write this system on the Hall Braille writer, which can be procured from the same firm.

The Committee has pursued its former plan of conducting its business by correspondence between members, but in addition to this, sessions have been held in April, 1914, and May, 1915, and frequent intervening sessions of sub-committees have been held as occasion demanded, the Executive Sub-committee having been authorized to deal with routine matters not involving any new or changed policy.

## RESULTS OF INVESTIGATIONS

In view of the fact that some of the characters employed in the punctographic systems now in use did not appear in any of our experiments illustrated in the alphabet tests in the 1913 Report, the Committee, in order to show the relative time required for reading each character and the relative degree of accuracy with which each character may be read, prepared a set of so-called Word Tests, which differed from the alphabet tests in that the characters stood alone and were called by their word names. The results of these tests were combined with the results obtained by the alphabet tests to give the Tables, Appendix B, from which selections were made for the assignments in the system herein set forth.

CAPITALS. Prior to the 1913 Report the Committee had tested only those forms of capitalization which are in use, and the results of our experiments were favorable to the American Braille form; but while it was the best of the accepted forms, the Committee felt that there might be other forms equally as good yet untried. Accordingly seven untried methods of capitalization were tested, and the results of these experiments indicate that the single-dot capital prefix or Braille italic sign is at least as good as the American Braille form. In view of this fact and of the great saving in space to be effected by the use of a sign occupying but one space-unit, the Committee has selected it as the capital prefix in the Standard Dot System.

WRITING. Considerable attention was given during the present term of investigation to writing, both with the tablet and the machine. The tests were two in number and were dictated to the writer for his transcription; one (a short prose selection involving most of the elements of the system) was the same in all types; for the other, two sets of sentences were selected, one because it contained a large percentage

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characters using few dots, while the other was chosen because it contained a large percentage of characters using many dots. In this test different material had to be used in each system. Thirty-one subjects were tested in tablet writing in British Braille, 48 in New York Point, and 22 in American Braille. Three tests were made with the Stainsby-Wayne writing machine and 13 with the Hall Braille-Writer. No opportunity was found for testing the Kleidograph.

Upon investigating the written papers, it was found that there was so much irregularity in the use of contractions, etc., that the Committee decided it would be necessary to count the characters and dots actually used in all of the written work; accordingly, the deductions drawn are from the actual number of characters and dots written rather than what should have been written according to the text.

Tables showing the results of these tests are on file with the Secretary of the Committee, from which we quote the two following general deductions: first, that the time is increased in writing the characters of many dots over those of few dots by about 30 to 35 per cent of the increase in number of dots, but this percentage would probably be slightly increased if an accurate estimate of the time lost by the writer in getting dictation could be made; and second, by combining the tests for American and British Braille tablet writing, we find that the average speed for Braille is .368 of a second per dot, and for New York Point, .470 of a second per dot.

With the most rapid writers in each system, the difference in the time required per dot in Braille and that required per dot in New York Point was somewhat less. Twenty-one of the fastest Braille writers, one-third of the whole number, took, on an average, .313 of a second per dot, while the sixteen fastest New York Point writers, approximately one-third of the whole number, took, .349 of a second per dot.

MUSIC. During our present term an effort was made to test the various music systems, and the results of these investigations indicate that any equivocation or other disturbing element that will cause confusion in the literary system has the same influence on the music system. No one will dispute that clearness and simplicity of expression where one is so wholly dependent upon the tangibility of the system, as in music, is of even greater importance than in a literary system where one may be helped to a certain extent by the context. Each music system tested shows decided advantages over the other in certain respects; for example, in the exercise testing the reading of notes and note values, the users of the Braille system required 30.6 per cent more time for reading, and made 103.4 per cent more errors than the users of New York Point; and in the exercise testing the reading of irregular groupings, the users of Braille required 36.3 per cent more time and made 246.2 per cent more errors than the users of New York Point, indicating, notwithstanding the strong feeling of users of Braille music to the contrary, that the same character representing more than one time-value has an unfavorable effect upon the legibility of the Braille sytem, causing hesitation and error.

In the exercise testing the reading of octave signs, the users of New York Point took 1.2 per cent more time, but the users of Braille made 119.2 per cent more errors than the users of New York Point. The increase in error by the users of Braille over those of New York Point appears due to the presence of low A and B and high C in this test, in the expression of which the practice is not uniform in the Braille system. This indicates that even though these notes rarely appear some regular provision should be made for them.

In the exercise testing the reading of expression marks, the users of New York Point took 7.5 per cent more time and made 48 per cent more errors than the users of Braille. It will be remembered that the expression marks in New York Point are arbitrary signs, while those in Braille are represented largely by the ink-print method of initial abbreviations which in the light of our experiments seem to be the better method. An experiment designed to test the relative legibility of the Braille and New York Point methods of expressing embellishment signs was made, but so few readers were found who were familiar with these signs in either system that we feel but little attention should be given to the results of this experiment.

The above-mentioned experiments were all designed to test reading; and it is interesting to note the difference between their results and the results on the exercises involving the use of the piano. In the exercise illustrating methods of fingering played with right hand while read with left, New York Point took 25.5 per cent more time and caused 37.5 per cent more error. In the exercise testing the playing with the right hand while reading with the left, using an accord-with sign, New York Point required 40.4 per cent more time than Braille and occasioned 28.5 per cent more error. In playing with the left hand, New York Point required 39.4 per cent more time, but Braille made 300 per cent more error than the New York Point; however, the percentage of error was very low in both systems, 11 readers of New York Point averaging .3 of an error to the reader and 21 readers of Braille averaging but 1.2 errors to the reader.

In the experiment testing the playing of intervals with the right hand while reading with the left, New York Point took 11.4 per cent more time than the Braille and had 21.1 per cent more error. In the experiment testing the playing of intervals with the left hand while reading with the right, New York Point

took 40.7 per cent more time, but Braille had 63.6 per cent more error. A slight irregularity in the use of an octave sign in this experiment occasioned a perceptible increase in the errors, which tends to give a wrong impression when comparing by number rather than by a classification of the errors. In view of this fact we feel that the experiments testing the use of intervals should be compared, for the present at least, by the relative time required for reading them with that for other kindred experiments.

Note that in the preceding experiment in the right hand, New York Point required 40.4 per cent and the left hand 39.4 per cent more time than the Braille, and in the experiment for playing intervals with the left hand 40.7 per cent more time was required by the New York Point, while in the experiment testing the playing of intervals with the right hand there was an increase of but 11.4 per cent in time, indicating that the two methods of reckoning intervals caused a perceptible loss in time, and that it was the right hand that was affected by this loss.

From the results of all these experiments we may draw the following conclusious: first, that the absence of equivocation in the New York Point system of musical notation is a material advantage, preventing doubt as to the identity of any character that may be used; but at the same time the conciseness of the Braille system is a decided advantage to one playing from the copy. We are, therefore, led to believe that if the equivocation were removed from the Braille system it might combine in a Standard Dot System of music the conciseness of Braille and the clearness of the New York Point to form a system far superior to any that has yet been submitted.

The principle of the variable base affords ample opportunity for development along this line and may be applied to the Braille music notation without seriously disturbing the plan of the system. Any equivocation in regard to time-values might be obviated by extending the characters to the right for one of the values having a common form, and since the notes of longer duration are apt to be less frequent than those of short duration, let us illustrate this by applying the third-base principle to the whole note, half note, and quarter note in the Braille system of music, leaving the 8th, 16th, 32d and 64th notes unchanged. For the whole note add to the 8th note dots 7 and 8; for the half note add dot 7; for the quarter note, add dot 8; for the 128th note add dot 9 to the 64th note. It is obvious that to go to the variable base for a system of music it would be necessary to make some further changes in the system, as finger signs and octave signs would be identical; therefore arbitrary finger signs on the plan of those used in New York Point might be employed. Other simple adjustments would be necessary in adapting to Braille music the principles of the variable base, such as the adjustment of dots, etc., but it should be borne in mind that both New York Point and the Braille system of music are wholly compatible with the principles of the Standard Dot literary system.

MATHEMATICS. The committee began early in the present term to take steps toward making investigation into the mathematical codes in the existing punctographic systems, but so few subjects were found who were sufficiently familiar with the authorized codes to submit to a test that we were forced to abandon making actual physical tests in mathematics. Even those who make habitual use of a tangible code in their teaching or other work we found generally using an adaptation of their own rather than the authorized code. This we found to be about as true in the case of one system as in that of another; therefore the mathematical notation herein submitted is based on a careful study into the needs of the system, and the assignments made according to the legibility and suggestiveness of the characters used.

## PROCEDURE IN CONSTRUCTION

The materials with which the construction agent has worked in evolving the punctographic system herein recommended for adoption is of a two-fold nature—punctographic characters, or symbols; and letters, letter-groups, and whole words, to be represented by the characters. A table of time and error values for all punctographic characters employed, authorized by the Committee, was made the basis from which to determine the relative efficiency or legibility of characters; while the "Eldridge Count" (Appendix C) extended so as to include proper names, numerals, and punctuation marks, not included in that count, though comprised in the text itself, was approved by the Committee as the source from which to derive relative recurrence of letters, letter-groups and whole words. The selection of this material for the basis of the Committee's count lies in the fact that it is neither too classical in form nor too commonplace in expression to render it of questionable value for the purpose.

The forty-eight thousand two hundred and three words comprised in the extended "Eldridge Count" were arranged in a table of monosyllables and one of polysyllables, listed alphabetically with the exact number of times that each recurred. The polysyllables were subdivided into their syllabic parts, in accordance with the practice authorized in the Standard International Dictionary, and listed alphabetically with the number of times that each syllable occurred at the beginning, in the middle and at the end of

words. The monosyllables and syllables were then distributed into all their possible letter-groups (Appendix D) and the recurrence of each letter-group duly tabulated. A table showing the exact source (word or syllable) from which each letter-group is derived, together with the exact recurrence in each case, was also prepared; and though too voluminous for the appendix of this report, it is on file with the secretary of the Committee, as is, also, the photographic copy of the eight pages of newspaper matter from which the "Eldridge Count" was taken.

The method of distributing monosyllables and syllables into all their possible letter groups is essentially as follows: Let it be required to distribute the word or syllable "dress" into all its possible letter-groups. In the alphabetic column headed "D" we enter the letter-group "dr", "dre," "dres," and "dress"; in column "R," the groups "re," "res," and "ress"; in column "E," the groups "es" and "ess"; and in column "S," the group "ss." The recurrence of the original word or syllable "dress" is entered opposite each of its letter-groups.

When this process was gone through for each of the monosyllables and polysyllables comprising the entire count, the letter-groups were all assembled, their respective recurrences totalled, and an alphabetic list arranged, showing the total recurrence of each group. (Appendix D.)

Again: The entire text of the extended "Eldridge Count" was distributed into its two hundred and twenty-one thousand seven hundred and eighty-seven letters, and each letter entered with its proper recurrence number. The capital letters, punctuation marks, and numerals were likewise counted and tabulated.

The table showing relative legibility of characters for purpose of assignment was prepared as follows: The average of letter and word times for the best character (Braille $a$ and New York Point $c$) was taken as 100. The average letter and word times for each character were then brought into their relation to this base. These values were divided by the accuracy values, character for character, and the quotients arranged in their numerical order from 100 upward.

In thus combining time and accuracy values, the best attainable base is reached for the assignment of characters in order of their relative legibility.

Having prepared these necessary tables, the next step was the actual selection of letter-groups and whole words most desirable for contractions. Many elements enter into consideration at this point, the relative recurrences of groups being the predominant feature in this case, as is the legibility in the case of characters to be assigned.

The amount of space saved, or, what is more to the point, the amount of matter brought within a single impulse of the touch, is a second element entering into the selection of groups.

The nature of the group itself is the next consideration. If it is one which conflicts constantly with other groups of higher recurrence value as the group $sc$ does with the groups $er$, $ed$, $en$ and $es$ in such combinations as $sed$, $ser$, $sen$ and $ses$, its introduction into the system would be productive of much hesitation in writing, and would lead to much irregularity in writing and printing, since there would always be a choice of contractions in writing such combinations.

The likelihood of groups to cross the syllable lines must also be taken into account; and, wherever a choice is given between two groups, one of which is not likely to violate this natural law in the division of words, the preference in selection is given to it. With these and minor features in mind, the work of selection goes on until the number of groups and whole words is equal to the number of characters selected for assignment.

When the respective recurrences of groups and words selected had been reduced to their non-conflicting values and the recurrences of the letters of the alphabet had been diminished in accordance with the number of each letter included in the contracted forms, the letters and groups were arranged in order of their non-conflicting recurrences from the highest down. The letters and groups were then assigned in order of their highest recurrences to characters in order of their highest legibility. In all assignments of characters care was taken, wherever practicable, to avoid combinations known to be productive of errors or hesitation. For character resemblances and capacity for errors, see Appendix A. No third-base character, however, was assigned to a letter or group whose primary value is part-word, these characters being assigned primarily to whole words. This distinction in assigning third-base characters is to avoid confusions between third-base and second-base characters, which confusions constitute more than 50 per cent of errors made on New York Point characters.

In the assignment of initial-letter contractions, etc., the practices long common to the existing systems were followed, wherever the ideas of suggestion and association could be introduced without too much sacrifice of legibility, and without introduction of equivocation due to similarity of form. No low-level characters are assigned to letters and letter-groups or words in the Standard Dot System, because of the great amount of hesitation and error which they are known to produce in both American and British Braille.

The method of procedure in the construction of both the ideal system (see Appendix G) and that based

upon the British Braille alphabet (see Appendix F) was essentially the same with the exception that in the latter case the alphabet and numerals were assumed as already assigned.

In the development of the system of punctuation marks therein presented, clearness of expression and economy of space have been the chief considerations.

The abandonment of low-level forms for whole-word or part-word contractions has left a goodly number of characters available for these and other kindred purposes.

Clearness and adequacy of expression are the chief considerations in determining the mathematical code, though considerable attention was given to economy of space.

## TABLE SHOWING CONDENSED ESTIMATE COMPARING SYSTEMS

in regard to the relative number of characters, dots, space and time required, and the speed, accuracy, and legibility afforded.

*Note.*—In this table the percentages are found by comparing each system with a hypothetical system taken as 100 per cent, using full spelling and affording perfect accuracy, in which every character is assumed to be equal to the best character, in the time, dots, and space required. British Braille is estimated with its capital prefix and with a space between all words, as in other systems; and New York Point is estimated with the $x$ capital prefix. In the block spacing, each block is assumed to equal 2 and $\frac{2}{3}$ dot-spaces horizontally.

| Systems | Number of Characters | Number of Dots | Space | | Time | Speed | Accuracy | Legibility |
| | | | Block Spacing | New York Interval | | | | |
|---|---|---|---|---|---|---|---|---|
| Ideal | 69.67% | 195.74% | | 98.71% | 88.54% | 112.94% | 95.76% | 108.15% |
| Standard Dot | 69.81% | 211.97% | | 101.17% | 91.67% | 109.09% | 95.03% | 103.67% |
| British Braille | 69.20% | 212.79% | 104.69% | | 97.15% | 102.93% | 92.70% | 95.42% |
| American Braille | 72.44% | 185.28% | 105.83% | 101.07% | 104.09% | 96.07% | 93.67% | 89.99% |
| New York Point | 85.17% | 226.72% | | 93.19% | 106.35% | 94.03% | 94.21% | 88.59% |

## CONCLUSIONS LEADING UP TO THE RECOMMENDATION OF THE STANDARD DOT SYSTEM

Having completed two systems of reading and writing above referred to - the one as nearly ideal as we have been able to make it, and the other based upon the European alphabet and numerals with the principles of recurrence and variable-base applied to the remaining material entering into its composition —the Committee decided that the advantages possessed by the former over those of the latter are not sufficient to justify the adoption of an entirely new system in preference to one based in so large a measure upon the same principles, and embodying in it so large a per cent of assignments already present in one of the existing systems.

On the motion to recommend the system based upon the British alphabet, a minority of the Committee, Mr. Fowler, voted in the negative, believing it wiser to adopt the system possessing the maximum of efficiency rather than the one possessing the advantage of an alphabet identical with that used in Great Britain. In this connection, the committee is glad to report that, notwithstanding this difference of opinion as to the relative weight of these two considerations, a spirit of co-operation prevails throughout the Committee.

In recommending the Standard Dot System herein presented, with a view to its becoming THE UNIFORM TYPE of the future, the Committee is actuated by the following considerations:

*First*—The variable base is the only common ground upon which the superior legibility of three-level characters can be combined with the advantages accruing from a supply of good symbols ample for all practical purposes.

*Second*—The application of the principle of recurrence, as modified by the substitution of *highest character-legibility* for *fewest dots,* insures to the system the greatest degree of accuracy and legibility.

*Third*—The practical elimination of the confusions caused by certain slanting open characters, and between upper and lower-level characters on the one hand, and between second and third-base characters

on the other, relieves the system of much of the equivocation inherent in one form or another in each of the existing systems.

*Fourth*—The accuracy, legibility and general efficiency of the system proposed, and the speed with which it can be read, are superior to the corresponding features of any existing system.

*Fifth*—Economy of space in the proposed system is greater than that in British Braille, practically equal to that of American Braille with New York intervals, and inferior only to that of New York Point. This economy in American Braille results from the unwise use of equivocal characters, at the expense of much legibility. Economy of space in New York Point is likewise secured at the expense of much time and legibility, the loss in this respect being largely due to some 20 per cent additional line length, which the finger must traverse to cover a given amount of reading matter. And while the economy of space of the British Braille is almost equal to that of the Standard Dot System, it is secured by the increase of more than 50 per cent in the number of different symbols employed, many of which are damagingly equivocal in character and excessively low in legibility.

*Sixth*—The labor of learning the Standard Dot System is simplified and reduced by the moderate number and unequivocal nature of the different characters comprised in its literary text. In this respect the system compares favorably with New York Point and American Braille, and does not, like British Braille, require an elaborate system of rules and exceptions. Moreover, retaining as it does the European alphabet, it enjoys, to an even larger degree, the advantages incident to the sequence of characters upon which the order of that alphabet is based.

*Seventh*—The variable, or continuous base upon which the suggested system is constructed, may be applied without serious inconvenience to any one of the three existing systems. This makes the apparatus for writing the system available for use in any or all systems, even to Moon-script, London Point, and Stericker.

*Eighth*—The primary, literal, and part-word powers assigned in this system to its first-base and second-base characters are such as to adapt it to the accurate and adequate expression of written and printed text in the French, German, and other leading literary languages, thus fitting it for inter-lingual use, as well as in pronouncing vocabularies in our own language; while about 40 of these and two dozen or more of the third-base characters are available if deemed desirable for assignment as symbols for words of high recurrence in the several languages, ancient and modern.

*Ninth*—Finally, the three-level variable base, removing as it does the hitherto insurmountable barriers between New York Point and the Brailles, will tend to make the transition from these systems to the Standard Dot an evolution rather than a revolution. This is especially true in view of the fact that if the Standard Dot System be printed or written without its third-base contractions and with a reduced letter interval equivalent to two-thirds of the space unit, it would show a gain of some five per cent upon the space which it now occupies; and if the third-base characters be used with the same reduced scale, the gain in space would be not less than ten per cent.

<u>ALPHABETIC KEY TO THE STANDARD DOT SYSTEM</u>

as arranged in May 1915 by the Uniform Type Committee of the American
Association of Workers for the Blind.

<u>THE ALPHABET</u> --- ˙ 1 a, ⠒ 1-2 b, ˙˙ 1-4 c, ˙⠒ 1-4-5 d,
˙. 1-5 e, ⠒˙ 1-2-4 f, ⠒⠒ 1-2-4-5 g, ⠒. 1-2-5 h, .˙ 2-4 i,
.⠒ 2-4-5 j, ⠒ 1-3 k, ⠒ 1-2-3- l, ⠒˙ 1-3-4 m, ⠒⠒ 1-3-4-5 n,
⠒. 1-3-5 o, ⠒˙ 1-2-3-4 p, ⠒⠒ 1-2-3-4-5 q, ⠒. 1-2-3-5 r,
˙⠒ 2-3-4 s, .⠒ 2-3-4-5 t, ⠒. 1-3-6 u, ⠒. 1-2-3-6 v, .⠒ 2-4-5-6 w,
⠒. 1-3-4-6 x, ⠒⠒ 1-3-4-5-6 y, ⠒. 1-3-5-6 z.

<u>THE NUMERALS</u> --- ˙ (1)1, ⠒ (1-2) 2, ˙˙ (1-4) 3, ˙⠒ (1-4-5) 4,
˙. (1-5) 5, ⠒˙ (1-2-4) 6, ⠒⠒ (1-2-4-5) 7, ⠒. (1-2-5) 8, .˙ (2-4) 9,
.⠒ (2-4-5) 0, .. (3-6) Numeral prefix.

<u>MARKS OF PUNCTUATION, ETC.</u> --- . 3 capital prefix and comma,
.. 3-9 whole-word capital prefix, ⠒ 2-3 period, italic prefix and
decimal point, ˙˙ 2-5 colon and small-capital prefix, .˙ 3-5 semicolon
and acute accent, ˙⠒ 2-5-6 apostrophe, ˙ 2 hyphen, ... 3-6-9 dash,
˙. 2-6 interrogation point and grave accent, .˙ 2-3-5 exclamation point,
tilde prefix, and circumflex accent ⠒⠒ ⠒⠒ 2-3-5-6  2-3-5-6 marks of parenthesis
.⠒ .⠒ 3-5-6  3-5-6 brackets, ⠒. ⠒. 2-3-6  2-3-6 quotation marks ⠒.. ⠒.. 2-3-6-9
2-3-6-9 interior quotation marks ˙.˙ 2-6-8 asterisk, .˙. 3-5-9 caret,
˙. 1-6 diaresis, and umlaut prefix, ⠒˙˙ 1-2-3-5-8 macron, ⠒˙. 2-3-4-8 breve,
˙˙. 2-5-9 cedilla with letter c, ⠒˙. 1-2-3-4-6-8 ampersand (&),
⠒. 1-4-5-6-9 dollar sign ($), ˙˙⠒ 1-4-8-9 cent sign (¢), ...⠒ 3-6-7-8-9
pounds sterling (£), ˙⠒. 1-4-5-8 degrees (°), ˙˙. 1-3-4-8 minutes ('),
.˙. 2-3-4-8 seconds ("), ⠒˙ 1-2-3-4 per cent (%).

<u>PART-WORD CONTRACTIONS</u> -- ⠒˙ 2-3-4-6 an, ⠒⠒ 1-2-3-4-6 and,
⠒. 1-2-4-6 ar, .⠒ 2-3-4-5-6 oh, .˙ 3-4-5 ed, ˙⠒ 1-5-6 en, ⠒. 1-2-6 er,
.⠒ 2-4-6 es, ˙⠒ 1-4-5-6 in, .⠒ 3-4-6 ing, ⠒. 1-2-3-5-6 is,
.⠒ 3-4-5-6 on, ⠒⠒ 1-2-3-4-5-6 or, ⠒⠒ 1-2-4-5-6 ou, ⠒. 1-2-5-6 th,
˙⠒ 1-4-6 tion.

<u>WHOLE-WORD CONTRACTIONS</u>-- .⠒ 2-3-4-6 an, ⠒⠒ 1-2-3-4-6 and, ⠒. 1-2-4-6
are, ⠒. 1-3-5-6 as, ˙⠒ 1-5-6 been, ⠒ 1-2 but, ⠒⠒ 1-3-4-5-6 by,
˙˙ 1-4, could, ⠒˙ 1-2-4 for, ˙⠒ 1-2-4-5 great, ˙. 1-2-5 had, .⠒ 2-4-5 has,
⠒. 1-2-3-6 have, ˙⠒ 1-4-5-6 in, ⠒. 1-2-3-5-6 is, ⠒. 1-3-4-6 it,
⠒ 1-2-3 little, ˙⠒ 1-3-4 made, ⠒. 1-3-4-5 not, ⠒ 1-3 of, .⠒ 3-4-5-6 on,
⠒⠒ 1-2-3-4-5-6 or, ⠒⠒ 1-2-4-5-6 out, ⠒˙ 1-2-3-4 people, .˙ 2-3-4 some,
⠒. 1-2-5-6 that, ˙. 1-5 the, ⠒. 1-2-3-5 their, ⠒⠒ 1-2-3-4-5 this,
.⠒ 2-3-4-5 to, ⠒. 1-3-6 under, ⠒. 1-2-6 were, .⠒ 2-3-4-5-6 which,
.⠒ 2-4-5-6 will, ˙⠒ 1-4-5 would, .˙ 2-4-6 yesterday.

<u>THIRD-BASE CONTRACTIONS</u>--- ⠒⠒˙ 1-2-4-5-7 about, ⠒˙˙ 1-2-4-7 after, ˙˙ 1-5-8
all, ˙˙ 2-4-7 be, ˙˙ 1-5-7 before, ⠒⠒˙ 1-2-4-7-8 day, ˙⠒. 1-4-5-8 do,
˙˙⠒ 2-5-7-8 first, ⠒˙. 1-2-4-8 from, ⠒.˙ 1-2-5-7 his, ˙.˙ 2-4-8 last,
⠒˙. 1-2-4-5-8 more, ˙˙˙ 1-4-7 other, .˙⠒ 2-4-7-8 over, ⠒.. 1-2-5-8 said,
˙.˙ 1-4-8 there, .⠒⠒ 2-4-5-7-8 time, ˙˙˙ 1-4-7-8 until, ⠒.⠒ 1-2-5-7-8 was,
˙⠒. 1-4-5-7-8 what, .˙˙ 2-4-5-8 when, ˙.⠒ 1-5-7-8 who, .⠒˙ 2-4-5-7 with,
˙˙ 2-5-7 work, ˙˙˙ 1-4-5-7 year.

# MATHEMATICAL NOTATION

The following list of symbols of operation, relation, and aggregation, for use in arithmetical, algebraic, and other mathematical expressions, will, it is believed, be found adequate for all ordinary requirements of such a system and more economic of space than any current system; and but few special rules or precautions seem necessary beyond those given in most mathematical text books.

When special abbreviations are employed which are not generally recognized in ordinary text books, nor in the system here presented, an alphabetic list of all such contractions should be prefixed to each volume in which the same are employed.

The numerals adopted for ordinary use are those already familiar to users of the Braille system in its several phases, being identical in shape with the first ten letters of the alphabet, viz.:

| | | | | | |
|---|---|---|---|---|---|
| Dot 1 | = 1 | Dots 1-4-5 | = 4 | Dots 1-2-5 | = 8 |
| Dots 1-2 | = 2 | Dots 1-5 | = 5 | Dots 2-4 | = 9 |
| Dots 1-4 | = 3 | Dots 1-2-4 | = 6 | Dots 2-4-5 | = 0 (Zero) |
| | | Dots 1-2-4-5 | = 7 | | |

The character ".." dots 3-6, with the usual letter interval following it, is prefixed to a number to show that the characters following it represent Arabic digits, rather than letters of a word.

When necessary to avoid ambiguity, the continuing effect of this numeral prefix may be terminated by inserting a comma, as is the common practice in American Braille. This is particularly necessary to separate a numerical coefficient from one of the first ten letters of the alphabet.

To obviate this necessity of prefixing the numeral sign to all numbers and of inserting a special discontinuance sign between numbers and certain following letters, a series of unambiguous third-base numerals may be employed, formed by affixing dots to the ordinary Standard Dot numerals according to the following plan: adding dots 5 and 8 to the digit 1; dots 4 and 7 to digit 2; dot 8 to digits 3, 6, and 9; and dot 7 to digits 4, 5, 7, 8, and to zero (0); the dot 8 thus being employed only when the original numerals end in an upper dot alone. The algebraic numerals so obtained are the following characters:

| | | | | | |
|---|---|---|---|---|---|
| Dots 1-5-8 | = 1 | Dots 1-4-5-7 | = 4 | Dots 1-2-5-7 | = 8 |
| Dots 1-2-4-7 | = 2 | Dots 1-5-7 | = 5 | Dots 2-4-8 | = 9 |
| Dots 1-4-8 | = 3 | Dots 1-2-4-8 | = 6 | Dots 2-4-5-7 | = 0 (Zero) |
| | | Dots 1-2-4-5-7 | = 7 | | |

In complex mathematical expressions, especially in printed works of an advanced technical character, this method of sharply distinguishing numerals from letters possesses undoubted value; but in mathematical tables not involving literal algebraic symbols, as well as in elementary arithmetical work, the ordinary first-base and second-base numerals are preferable.

The continuing effect of the signs of multiplication, division, denominator, exponent, radical, bracket, parenthesis, or other signs of aggregation, is discontinued by inserting such active sign with the addition of a lower dot (point nine) without intervening space.

The period (":" dots 2, 3) is the decimal separatrix to be used as in visual writing and printing.

The divergencies, in any punctographic system of mathematical notation, from ordinary ink-print usage, are chiefly due to the limited number of conveniently available characters and the necessity placing of the characters very nearly upon a common level.

The numerator of a fraction, unless it is a monomial, should be enclosed within parentheses and followed by the denominator prefix. The denominator may or may not require to be enclosed within parentheses. When the numerator or denominator is a fraction or mixed number, it should be enclosed within parentheses. If a fraction appears in both numerator and denominator the whole expression should be enclosed within brackets or braces. Brackets or braces may be doubled without interval to indicate that other parenthetical quantities of a lower grade are enclosed within these.

The discontinuance sign required in the interior of a mathematical expression may usually be omitted as superfluous at the close of such an expression; but the fraction prefix ( ) necessary in mixed numbers and other interior positions may often be omitted before simple fractions.

The following assignments should occasion little difficulty, especially if three-level, variable-base writing and printing apparatus be employed.

| | |
|---|---|
| 2-4-6 | Addition — read "plus" (+) |
| 3 | Subtraction = minus (—) |
| 2-4-6-8 | Double sign = plus-or-minus (∓) |
| 2-5-7-9 | Double sign = minus-or-plus (±) |
| 1-5-6 | Multiplication = multiplied by ( ) |
| 1-5-6-9 | Close of factor = multiplier ended |
| 1-4-5-6 | Division = divided by (÷) |
| 1-4-5-6-9 | Divisor ended |
| 1-2-4-5-6 | Equality = equals (=) |
| 1-2-3-5-6 | Inequality = greater than (>) |
| 2-3-4-5-6 | Inequality = less than (<) |
| 1-2-3-4-5-6 | Vinculum or bar |
| 2-3 | Decimal point (period) (.) |
| 1-2-3-4-6 | Numerator prefix — fraction warning |
| 3-4 | Demominator prefix — fraction line (/) |
| 3-4-9 | Close of fraction — denominator ended |
| 1-4-5-6-9 | Dollar sign (prefix) ($) |
| 1-4-8-9 | Cent sign (suffix) (¢) |
| 3-6-7-8-9 | Pounds sterling (prefix) (£) |
| 1-4-5-8 | Degrees (suffix) (°) |
| 1-3-4-8 | Minutes or primes (suffix) (′) |
| 2-3-4-8 | Seconds (suffix) (″) |
| 1-2-3-4 | Per cent (suffix) (%) |
| 2-5 | Ratio = is to (:) |

| | |
|---|---|
| 2-5-2-5 | Proportion as (::) |
| 3-4-5-6 | Exponent sign (placed between the given root and the exponent.) |
| 3-4-5-6-9 | Discontinuance of exponent (like exponent sign to be omitted when the exponent is a simple numeral.) |
| 1-2-5-6 | Radical sign (prefix, to be immediately followed by the proper index within braces if other than the square root is to be indicated.) |
| 1-2-5-6-9 | Radical terminal (needed only in interior positions.) |
| 3-6 prefixed without intervening letter space | Special capital, Greek letter, or subscript prefix. |
| 2-3-5-6—2-3-5-6-9 | Parentheses (opening and closing) ( ) |
| 3-5-6 —3-5-6-9 | Brackets (opening and closing) ([ ]) |
| 2-3-6—2-3-6-9 | Braces (employed especially to enclose radical indexes, literal, fractional, negative, and compound exponents, and other superior letters or figures.) |
| 1-2-3-6-9 | Angle sign (∠) |
| 2-3-5-6-8-9 | Infinity |
| 2-3-6-8-9 | Differential |

# RECOMMENDATIONS

The Uniform Type Committee respectfully recommends to the American Association of Workers for the Blind:

*First*—That the Association accept and adopt for itself officially, and that it urge upon its members that they accept and adopt, for themselves individually, the Standard Dot System of reading and writing as herein presented, together with its mathematical assignments, and that the members of the Association, collectively and individually, avail themselves of every opportunity to hasten its establishment as the Uniform Type for the Blind.

*Second*—That the Association make such representations as it may deem appropriate to the American Association of Instructors of the Blind, the American Printing House for the Blind, the National Institute for the Blind, and such other organizations, including associations, printing houses, schools, libraries, etc., as may seem advisable, with a view to securing similar action on their part, and their active and early co-operation.

*Third*—That the Association make such representations to these organizations as it may deem appropriate to secure the joint establishment, by itself and the American Association of Instructors of the Blind, of a permanent commission of three; one appointed by each of the said associations, and the third selected by these two, or appointed by a third organization whose co-operation in the establishment of the commission it may be deemed wise to seek. The duties of said commission to be:

*A.* The completion and perfection of the Standard Dot System, including minor changes therein if necessary, provided always that such alterations shall not violate the fundamental principles on which the system is based.

*B.* To act as a board of reference and arbitration in deciding upon practice and use, in and of, the Standard Dot System; interpret the application of its principles, should users be in doubt; advise with printers or others concerning the technical points involved in their use of the system; and

*C.* In every way found possible to foster and facilitate the introduction, establishment, and perpetuity of the Standard Dot System as the Uniform Type for the Blind.

(*Note.*—This recommendation is made with the consciousness on the part of the Committee that it is humanly impossible to foresee all contingencies, and that although its work has been as thorough and far-reaching as it was possible to make it, we realize that actual practice may bring to light defects and incompletenesses, as well as raise questions concerning practice and application of the system, which it has been impossible for us to anticipate, but with the firm conviction that the fundamental principles which we have set forth are sound, and should be held inviolable.)

*Fourth*—That your Committee be forthwith discharged.

# Appendix A

## ANALYSIS OF ERRORS MADE IN READING THE SHEETS ON WHICH THE DIFFERENT PUNCTOGRAPHIC CHARACTERS WERE TESTED AS TO THEIR RELATIVE LEGIBILITY

The method of testing the characters was to present to the readers a succession of single sheets on which the characters tested were mixed with the other characters, but repeated more times than the others. The time taken by each reader for reading each sheet and the errors made were both recorded.

### Part I.   Alphabet Tests, Taken Prior to the 1913 Convention

For the average time and average *number* of errors for each *sheet* of the alphabet tests, see 1913 Report, pages 18, 19, and 45.   On page 19 of that Report, attention is called to the fact that the numbers given apply to the sheets, and not necessarily in every case simply to the individual letters themselves.   But the records were kept as to just what the errors were as well as the numbers, and have since been classified and analyzed.   (See 1913 Report, foot of page 45.)

The alphabet tests were designed to solve Question 1 of the Outline, namely, "What is the relative legibility of the letters in each system?"   (See 1913 Report, page 9.)

A study of the errors shows that each system has its own characteristic errors, that is, certain errors to which the great majority of readers are most liable on account of the special peculiarities of the letters themselves and their relation to each other.

The fractions in the lists of errors result from getting the proportion of the errors to the same number of readings for all characters.

# Analysis of Errors on the British Braille Alphabet Test

## Characters Used



Following is a list of the errors on the British Braille alphabet test:

| Letter | called | Letter | Value | Letter | called | Letter | Value | Letter | called | Letter | Value | Letter | called | Letter | Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| q | called | r | 59.00 | f | called | d | 6.31 | v | called | w | 2.53 | v | called | o | 1.27 |
| z | " | o | 54.42 | q | " | k | 6.00 | a | " | c | 2.00 | z | " | u | 1.27 |
| n | " | o | 49.34 | y | " | x | 6.00 | a | " | o | 2.00 | z | " | r | 1.27 |
| y | " | z | 49.00 | r | " | h | 5.41 | b | " | a | 2.00 | z | " | j | 1.27 |
| y | " | n | 47.00 | p | " | q | 5.08 | b | " | l | 2.00 | r | " | j | 1.08 |
| d | " | e | 44.26 | n | " | q | 5.08 | g | " | c | 2.00 | r | " | v | 1.08 |
| z | " | y | 43.01 | m | " | p | 5.06 | i | " | f | 2.00 | r | " | y | 1.08 |
| m | " | x | 32.89 | m | " | f | 5.06 | i | " | s | 2.00 | b | " | h | 1.00 |
| x | " | u | 25.00 | f | " | b | 5.06 | k | " | b | 2.00 | b | " | p | 1.00 |
| o | " | n | 24.00 | b | " | f | 5.00 | l | " | p | 2.00 | b | " | q | 1.00 |
| l | " | b | 24.00 | g | " | d | 5.00 | o | " | e | 2.00 | b | " | v | 1.00 |
| w | " | y | 22.89 | t | " | s | 5.00 | q | " | w | 2.00 | c | " | e | 1.00 |
| r | " | q | 18.39 | g | " | j | 5.00 | q | " | x | 2.00 | c | " | f | 1.00 |
| j | " | h | 18.30 | y | " | k | 5.00 | t | " | q | 2.00 | c | " | h | 1.00 |
| k | " | u | 18.00 | h | " | f | 4.58 | y | " | i | 2.00 | c | " | k | 1.00 |
| n | " | z | 16.45 | w | " | j | 4.58 | y | " | p | 2.00 | c | " | x | 1.00 |
| n | " | y | 15.18 | r | " | w | 4.32 | y | " | q | 2.00 | c | " | z | 1.00 |
| c | " | a | 14.00 | e | " | i | 4.00 | h | " | c | 1.53 | e | " | a | 1.00 |
| g | " | h | 14.00 | s | " | c | 4.00 | h | " | k | 1.53 | e | " | c | 1.00 |
| g | " | f | 14.00 | s | " | o | 4.00 | j | " | f | 1.53 | e | " | h | 1.00 |
| k | " | l | 14.00 | x | " | n | 4.00 | j | " | r | 1.53 | g | " | a | 1.00 |
| u | " | x | 13.92 | y | " | o | 4.00 | j | " | u | 1.53 | g | " | m | 1.00 |
| m | " | u | 13.92 | y | " | w | 4.00 | j | " | w | 1.53 | g | " | q | 1.00 |
| h | " | j | 13.72 | z | " | x | 3.81 | j | " | y | 1.53 | g | " | x | 1.00 |
| o | " | z | 13.00 | u | " | o | 3.80 | w | " | f | 1.52 | k | " | a | 1.00 |
| z | " | n | 12.65 | u | " | m | 3.80 | w | " | g | 1.52 | k | " | f | 1.00 |
| m | " | k | 11.39 | v | " | y | 3.79 | w | " | q | 1.52 | k | " | q | 1.00 |
| o | " | r | 11.00 | v | " | u | 3.79 | d | " | a | 1.27 | k | " | w | 1.00 |
| q | " | t | 11.00 | v | " | l | 3.79 | d | " | b | 1.27 | l | " | e | 1.00 |
| s | " | t | 11.00 | h | " | g | 3.05 | d | " | g | 1.27 | l | " | h | 1.00 |
| x | " | y | 11.00 | h | " | v | 3.05 | d | " | i | 1.27 | l | " | n | 1.00 |
| j | " | i | 10.67 | j | " | d | 3.05 | d | " | j | 1.27 | l | " | s | 1.00 |
| u | " | v | 10.12 | j | " | g | 3.05 | d | " | n | 1.27 | o | " | i | 1.00 |
| q | " | g | 10.00 | j | " | k | 3.05 | d | " | w | 1.27 | o | " | k | 1.00 |
| h | " | x | 9.15 | j | " | z | 3.05 | d | " | x | 1.27 | o | " | u | 1.00 |
| h | " | e | 9.15 | w | " | r | 3.05 | f | " | c | 1.27 | q | " | o | 1.00 |
| e | " | d | 9.00 | w | " | u | 3.05 | f | " | h | 1.27 | q | " | c | 1.00 |
| i | " | j | 9.00 | g | " | b | 3.00 | f | " | i | 1.27 | q | " | v | 1.00 |
| s | " | i | 9.00 | i | " | e | 3.00 | f | " | j | 1.27 | a | " | y | 1.00 |
| f | " | v | 8.86 | k | " | x | 3.00 | f | " | q | 1.27 | a | " | i | 1.00 |
| u | " | k | 8.85 | l | " | v | 3.00 | m | " | b | 1.27 | b | " | d | 1.00 |
| p | " | s | 8.85 | q | " | u | 3.00 | m | " | h | 1.27 | s | " | l | 1.00 |
| p | " | v | 8.85 | s | " | p | 3.00 | m | " | w | 1.27 | s | " | n | 1.00 |
| k | " | m | 8.00 | y | " | r | 3.00 | m | " | y | 1.27 | s | " | v | 1.00 |
| q | " | p | 8.00 | t | " | j | 3.00 | n | " | w | 1.27 | t | " | d | 1.00 |
| s | " | z | 8.00 | t | " | r | 3.00 | p | " | l | 1.27 | t | " | p | 1.00 |
| p | " | f | 7.58 | d | " | f | 2.53 | p | " | r | 1.27 | t | " | w | 1.00 |
| r | " | o | 7.57 | f | " | g | 2.53 | p | " | y | 1.27 | y | " | v | 1.00 |
| q | " | n | 7.00 | f | " | p | 2.53 | u | " | e | 1.27 | y | " | j | 1.00 |
| x | " | k | 7.00 | p | " | b | 2.53 | u | " | q | 1.27 | y | " | f | 1.00 |
| x | " | m | 7.00 | u | " | n | 2.53 | u | " | y | 1.27 | x | " | w | 1.00 |
| x | " | z | 7.00 | u | " | z | 2.53 | v | " | h | 1.27 | x | " | r | 1.00 |
| z | " | s | 6.33 | v | " | f | 2.53 | y | " | j | 1.27 | | | | |

Total, 1,264.28.

The number of different errors is 211.

As an aid in the analysis of these errors, the numbers against each letter are arranged in the following two columns, side by side. The first column gives the number of errors on each letter in the numerical order of the errors, and the second column gives the number of errors involving each letter, for every error involves two letters. It will be seen that *a* and *y* stand at the extremes in both columns, as being involved in the smallest and largest number of errors respectively; but in looking through the two columns it will be seen that there is some changing of the relative places of many of the letters. Some of these changes are very significant in showing *the influence of the letters upon each other in legibility.* While *a* remains on the same level or rank, namely, at the top of both columns, *b* goes down and *c* goes up in the second column. Why do these two letters, which are alike except for the vertical and horizontal positions, change places in this opposite way in these two columns? It is because *b* is intermediate in height between *a* and *l*, while *c* is not intermediate in length between *a* and a three-dot horizontal character, as there are no such characters in British Braille. In New York Point the case is reversed. This same character of two horizontal dots (called *a*) is intermediate in length between one and three (called *c* and *l*), and suffers from that cause far more than *b* in British Braille suffers from its intermediate height between *a* and *l*, while the vertical two-dot character in New York Point (called *i*) is not intermediate in height between one and three. Turning to the corresponding columns in the analysis of the New York Point alphabet, page 27, it is remarkable to find that the character of two horizontal dots (*a*) goes to the foot of the second column as being involved in the largest number of errors, and the character of two vertical dots (*i*) goes to the top; these two letters in New York Point, *a* and *i*, alike except for the horizontal and vertical positions, being involved in the largest and smallest number of errors respectively, owing to the confusion between second and third base. This is an illustration of what is meant by the influence of letters upon each other in regard to legibility. Of course British Braille *c*, New York Point *a*, and American Braille *r* have the same absolute legibility as each other if printed in the same scale and examined individually; and the same is true in regard to British Braille *b*, New York Point *i*, and American Braille *t*; but in each system their relative legibility, that is, the quickness and certainty with which they can be distinguished from all the other characters, depends upon their similarity to, or contrast with other characters.

*British Braille Alphabet*

| Errors on each letter | | Errors involving each letter | |
| --- | --- | --- | --- |
| a | 6.00 | a | 26.27 |
| b | 14.00 | c | 32.80 |
| e | 16.00 | t | 38.00 |
| i | 16.00 | i | 46.21 |
| t | 16.00 | b | 53.13 |
| c | 20.00 | l | 55.06 |
| v | 20.24 | v | 59.20 |
| f | 31.64 | w | 59.32 |
| l | 33.00 | p | 61.29 |
| p | 36.70 | s | 65.18 |
| w | 38.13 | g | 68.42 |
| r | 38.93 | e | 77.68 |
| s | 42.00 | f | 80.97 |
| y | 45.76 | d | 82.31 |
| g | 47.00 | h | 91.28 |
| j | 48.82 | j | 91.28 |
| k | 49.00 | m | 93.20 |
| u | 49.36 | k | 95.82 |
| o | 53.00 | u | 119.92 |
| d | 56.95 | r | 123.05 |
| x | 63.00 | x | 137.04 |
| m | 73.40 | q | 150.61 |
| n | 87.32 | o | 180.40 |
| q | 111.00 | n | 187.77 |
| z | 124.03 | z | 224.06 |
| y | 127.00 | y | 230.29 |
| | 1264.28 | | 2528.56 |

## Special Analysis for Each Letter on the British Braille Alphabet

1. *y.* Taking up now the special analysis for each letter, we will begin with *y*, against which is recorded the largest number of errors, namely, 127. In the 1913 Report we find that the *y* sheet also took more *time* than any other in the British Braille alphabet except the *q* sheet.

Of the 127 errors on *y*, 75.6 per cent were caused by mistaking *y* for *n* or *z*, by missing one or the other of the corner dots. The uncertainty in regard to the corner dots in *y*, and the resulting confusion with *n* and *z*, are further demonstrated by noticing that *n* and *z* were both frequently called *y*. Failure to perceive a dot that is there is a tactual error; imagining a dot to be there when it is not is partly mentally caused by similarity of shape, and by the subconsciousness that if it is there, it is quite likely not to be felt, the readers having learned from experience that those special dots are liable to be missed. Where dots are thick, failure to perceive a space is also a tactual error.

2. *n* and *z.* The sheet which tested these two letters proved to be one of the poorest for both *time* and *errors*, ranking nearly as low as the *y* and *q* sheets. Most of the errors on *n* and *z* were caused by confusing them with *o* on the one hand, or *y* on the other, or with each other.

3. *o.* Errors: *o* called *n*, 24; *z*, 13; *r*, 11; *c*, 2; *i*, 1; *k*, 1; *u*, 1; total, 53.

Further comparisons between *y, n, z* and *o.* These letters evidently feel more alike than they look. As they all open toward the left, the direction from which the finger encounters them in reading, it is easy to see that they seem more alike from that standpoint. In reading, the letters are not examined equally from all sides as they are when learning, but the point of attack is from the left, and any necessity of returning upon the letter to make its identity certain causes hesitation and interferes with the concentration of the mind upon the ideas expressed.

4. *q* and *r*. Missing either one of the five dots in *q* makes another letter. Q called *r* by missing the upper right corner dot was the most frequent error in the whole British alphabet test, and the *q* sheet took the longest time to read.

In American Braille *q* is the same as in British Braille, and occasioned far more errors than any other letter in American Braille. As two other characters, *x* and *z* in American Braille, are of the same shape and number of dots as *q*, differing only in position, *q* was very often mistaken for *them*, which, of course, could not occur in the British alphabet test; but next in number to those two errors on *q* in the American Braille alphabet is the calling of *q k* 50.21 times by missing the right upper dot; *k* in American Braille being the same as *r* in British Braille.

5. *m*, *u*, *k* and *x*. These are the four open characters used in the British alphabet. Most of the errors on these letters were confusions with each other on account of uncertainty between one and two dots horizontally. The average number of errors for this group is 56.95.

6. *g*. The only characteristic errors on *g* were caused by missing one of the corner dots, and so calling it one of the little triangular characters, *h*, *f*, *d* or *j*, and we notice that in these errors on *g*, the right hand dots were missed 28 times and the left ones 10 times.

7. *d*, *f*, *h*, and *j*. We find there are two kinds of characteristic errors on these triangles, namely, confusions with *c* and *i*, by missing the corner dots, and confusions with each other. The *right* corner dots were missed 54.93 times, and the *left* corner dots were missed 10.42 times. This is still further evidence that corner dots on the right side of the characters are more apt to be missed than on the left, meaning, of course, only those in which there are two dots adjoining, not a corner dot exposed by space around it. In the analysis on *y*, *n*, *z* and *o* there can be no comparison between right and left corners, for there are no left corners on those letters, but in view of this analysis of errors on *d*, *f*, *g*, *h* and *j*, where right and left had about an equal chance in a large number of chances, it seems reasonable to infer that the errors on *y*, *n*, *z* and *o* would have been much less if the corners had been on the left instead of the right.

8. *s*. Calling *s*, *t*, or *p*, is owing to general similarity of shape and slant. All three of these letters stood the test well.

9. *t*. Calling *t*, *s p* or *q* is also owing to a general similarity of shape and slant. Two special sheets of words were prepared to compare *t* and *b*, as supplementary to the alphabet tests. The words selected were in pairs, like *tell* and *bell*, *cat* and *cab*, etc. (See 1913 Report, Appendix E, lists 215 and 216.) The words with *t* were put on one sheet and the words with *b* on the other. The *t* sheet had 16.7 per cent more errors than the *b* sheet including *all* the errors, but took only 1 per cent more time. (See 1913 Report, Experiment F, page 15.) The words were simple and short, and they read the *t* sheet so fast that they could not read the *b* sheet much faster. The errors, however, show that the *t* sheet could not be read as accurately as the *b* sheet without reading it more slowly. On the *t* sheet, *t* was miscalled 100 times, and on the *b* sheet *b* was miscalled 55 times, making 81.8 per cent more errors on *t* than on *b* on these two lists of words.

10. *w*. There were not many strikingly characteristic errors on *w* in the British alphabet test. In American Braille, *w* was confused with *z*, a character which is not in the British alphabet.

11. *p* and *v*. The principal cause of the larger number of errors on *p* than on *v* is not a difference of absolute legibility, but is owing to the influence of the similarity of other letters to *p*, from which *v* was free; namely, *p* called *s* and *q*. Had *v* been subject to similar competition, it would probably have added as many errors to *v*. Those two errors on *p* account for most of the difference between the errors on *p* and *v*. In American Braille *v* did have *b* and *x* to compete with, which bear the same relation in shape to *v* as *s* and *q* bear to *p* in British Braille, and this did occasion several errors on *v* in American Braille. In all probability they are both better than their opposites turned the other way, in which the corner dot is on the right instead of the left.

12. *l*. Errors: *l* called *b*, 24; *v*, 3; *p*, 2; *c*, 1; *h*, 1; *n*, 1; *s*, 1; total, 33.

13. *e* and *i*. These diagonal two-dot characters stood the test better in this alphabet than the horizontal two-dot character, but not as well as the vertical two-dot character.

14. *a*, *b* and *c*. The analysis on these characters is given in connection with the two British Braille columns on page 18.

## Evidence on Question 2 of the Outline (1913 Report, page 9)

"Are characters of few dots easier to read than characters of many dots?"

### Table Showing Relative Errors and Time in Reading Letters of Few Dots and Many Dots in the British Alphabet Test

| | Total errors | Average errors | Average time for reading 60 of each letter* | | Total errors | Average errors | Average time for reading 60 of each letter* |
|---|---|---|---|---|---|---|---|
| 1-dot letter { a | 6.00 } | 6.00 | 16.94 seconds | | | | |
| 2-dot letters { b | 14.00 | | | 4-dot letters { t 16.00<br>v 20.24<br>p 36.70<br>r 38.93<br>g 47.00<br>x 63.00<br>n 87.32<br>w 38.13<br>z 124.03 } | | 52.37 | 32.06 seconds |
| l | 16.00 | (16.50) | | | | | |
| e | 16.00 | 23.00 | 22.83 " | | | | |
| c | 20.00 | | | | | | |
| k | 49.00 } | | | | | | |
| 3-dot letters { f | 31.64 | | | 5-dot letters { q 111.00<br>y 127.00 } | | 119.00 | 35.21 " |
| l | 33.00 | | | | | | |
| s | 42.00 | | | Total, 1264.28 | | | |
| h | 45.76 | | | | | | |
| j | 48.82 | 48.21 | 27.86 " | | | | |
| u | 49.36 | | | | | | |
| o | 53.00 | | | | | | |
| d | 56.95 | | | | | | |
| m | 73.40 } | | | | | | |

\* See 1913 Report, page 45.

### Conclusions on the British Braille Alphabet Test

From this analysis it appears that the principal causes of errors on the British alphabet test were:

*First*—A general similarity of shape and position between y, n, z and o, all opening toward the left, resulting in uncertainty as to the presence or absence of the corner dots on the right side of these letters. American Braille was free from this special confusion because j, like British y, is the only one of these forms in the American Braille alphabet. New York Point is free from this cause of error.

*Second*—Uncertainty as to the presence or absence of corner dots on the right of other letters, q and r, d and j, and q. This cause of error was manifest to a much greater extent in American Braille on account of there being three forms similar to q to be confused with two forms like r. The New York Point alphabet test is somewhat subject to this kind of error, that is, uncertainty as to the presence or absence of right hand corner dots, but this is not a specially characteristic error in New York Point.

*Third*—Another kind of similarity of shape in m, u, k, and x, causing uncertainty between one and two dots horizontally. This *kind* of error between the open characters was nearly negligible in the American Braille alphabet test, and there are no open characters in the New York Point alphabet. In all the alphabets however, there is some confusion between one and two dots horizontally, but it is especially conspicuous in these four letters in British Braille.

## Analysis of Errors on the American Braille Alphabet Test

### Characters Used

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| n | o | p | q | r | s | t | u | v | w | x | y | z | . |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Following is a list of the errors in the American Braille alphabet test:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| q | called | z | 204.89 | h | called | k | 6.30 | q | called | w | 2.71 | c | called | a | 1.24 |
| n | " | u | 160.45 | w | " | c | 6.09 | c | " | h | 2.47 | c | " | g | 1.24 |
| e | " | a | 125.72 | v | " | h | 5.58 | c | " | d | 2.47 | c | " | n | 1.24 |
| p | " | m | 125.64 | j | " | k | 5.57 | c | " | y | 2.47 | c | " | t | 1.24 |
| z | " | q | 90.90 | x | " | h | 5.43 | d | " | c | 2.47 | d | " | g | 1.24 |
| k | " | x | 64.48 | z | " | d | 5.43 | d | " | f | 2.47 | d | " | m | 1.24 |
| x | " | k | 59.70 | a | " | r | 5.27 | d | " | r | 2.47 | d | " | p | 1.24 |
| u | " | n | 59.00 | m | " | s | 5.08 | y | " | c | 2.43 | k | " | b | 1.22 |
| q | " | x | 55.63 | c | " | k | 4.94 | y | " | j | 2.43 | k | " | g | 1.22 |
| q | " | k | 50.21 | d | " | t | 4.94 | w | " | j | 2.43 | k | " | j | 1.22 |
| w | " | k | 45.01 | y | " | i | 4.87 | w | " | y | 2.43 | w | " | d | 1.22 |
| k | " | w | 38.94 | f | " | h | 4.73 | b | " | h | 2.43 | w | " | t | 1.22 |
| m | " | p | 35.60 | h | " | j | 4.73 | b | " | o | 2.43 | w | " | x | 1.22 |
| a | " | e | 34.54 | h | " | o | 3.72 | b | " | y | 2.43 | y | " | n | 1.22 |
| d | " | o | 28.43 | v | " | k | 4.65 | m | " | r | 2.04 | y | " | s | 1.22 |
| z | " | w | 25.78 | n | " | y | 4.55 | g | " | x | 1.86 | y | " | x | 1.22 |
| z | " | x | 24.42 | i | " | o | 4.42 | j | " | q | 1.86 | m | " | b | 1.02 |
| x | " | z | 24.72 | g | " | f | 4.02 | j | " | x | 1.86 | m | " | n | 1.02 |
| b | " | v | 24.35 | a | " | i | 3.77 | l | " | s | 1.86 | m | " | y | 1.02 |
| g | " | j | 24.15 | j | " | w | 3.72 | l | " | v | 1.86 | u | " | b | 1.02 |
| k | " | q | 23.12 | c | " | w | 3.70 | o | " | h | 1.86 | u | " | r | 1.02 |
| c | " | i | 19.77 | d | " | w | 2.70 | r | " | i | 1.86 | g | " | m | .93 |
| r | " | a | 16.72 | y | " | v | 3.65 | t | " | i | 1.86 | g | " | n | .93 |
| j | " | g | 16.72 | k | " | v | 3.65 | t | " | o | 1.86 | g | " | o | .93 |
| x | " | q | 16.29 | o | " | d | 3.57 | s | " | n | 1.86 | g | " | y | .93 |
| w | " | z | 13.39 | f | " | d | 3.15 | f | " | l | 1.57 | j | " | c | .93 |
| v | " | b | 12.08 | f | " | m | 3.15 | f | " | o | 1.57 | j | " | h | .93 |
| l | " | t | 12.07 | f | " | r | 3.15 | f | " | t | 1.57 | j | " | n | .93 |
| s | " | u | 11.14 | h | " | c | 3.15 | f | " | i | 1.57 | j | " | u | .93 |
| t | " | l | 11.14 | m | " | u | 3.05 | h | " | f | 1.57 | j | " | y | .92 |
| g | " | h | 9.29 | u | " | v | 3.05 | h | " | u | 1.57 | l | " | a | .93 |
| i | " | c | 8.85 | p | " | u | 3.03 | h | " | w | 1.57 | l | " | r | .93 |
| g | " | z | 8.36 | i | " | y | 2.96 | n | " | j | 1.51 | l | " | u | .93 |
| j | " | z | 8.36 | h | " | g | 2.92 | n | " | s | 1.51 | l | " | y | .93 |
| z | " | g | 8.14 | g | " | c | 2.79 | p | " | a | 1.51 | o | " | l | .93 |
| y | " | b | 7.30 | g | " | q | 2.79 | p | " | s | 1.51 | s | " | a | .93 |
| y | " | w | 7.30 | j | " | v | 2.79 | p | " | t | 1.51 | s | " | l | .93 |
| k | " | h | 7.30 | o | " | b | 2.78 | i | " | l | 1.48 | s | " | p | .93 |
| u | " | s | 7.12 | s | " | m | 2.79 | i | " | r | 1.48 | t | " | f | .93 |
| q | " | g | 6.78 | t | " | a | 2.79 | q | " | c | 1.36 | v | " | y | .93 |
| v | " | l | 6.50 | z | " | j | 2.71 | x | " | v | 1.36 | r | " | d | .93 |
| v | " | u | 6.50 | x | " | g | 2.71 | x | " | w | 1.36 | a | " | o | .75 |
| v | " | x | 6.50 | x | " | j | 2.71 | z | " | k | 1.36 | | | | |
| f | " | g | 6.30 | x | " | u | 2.71 | z | " | v | 1.36 | | Total, | | 1859.16 |

The number of different errors is 174.

As an aid in the analysis of these errors, the numbers against each letter are arranged in the following two columns, side by side. The first column gives the number of errors on each letter in the numerical order of the errors, and the second column gives the number of errors involving each letter. Nineteen of the characters are the same as those used in the British alphabet test, but only twelve have the same meaning. In this analysis we will see how these are affected by the different companionship amongst which they find themselves in the American Braille alphabet.

Beginning with a, we find that instead of standing at the top of the first column, as it does in the corresponding British Braille column, page 5, it is lowered to the tenth rank in the first American Braille column by having to compete with another one-dot letter.

O, corresponding to British e, takes the place at the top of the first American Braille column, having the fewest errors, but goes down to the eighth place in the second column on account of d being called o many times. This corresponds very closely with the shifting of British e from the third place in the first column to the tenth in the second, on account of d being called e many times in that test.

In the comparison of the two columns in British Braille, we found that the relative positions of b and c in the second column are reversed from what they are in the first, and in the American Braille we find that the same is true of the same two characters called l and r, and the reason is the same. (See page 18.)

### Special Analysis for Each Letter in the American Braille Alphabet Test

1. q, x, and z. A study of the errors on these letters shows that there were two kinds of especially characteristic errors, namely, confusions with each other and confusions with k and w.

2. k and w. The most frequent error on these letters was confusing them with q, x, and z.

3. s, m, u, p, and n. Errors:

*American Braille Alphabet*

| Errors on each letter | | Errors involving each letter | |
|---|---|---|---|
| o | 9.14 | f | 35.75 |
| s | 18.58 | r | 35.87 |
| t | 18.58 | s | 36.89 |
| i | 19.19 | t | 41.13 |
| l | 19.51 | l | 42.06 |
| r | 19.51 | y | 51.21 |
| h | 26.51 | i | 52.89 |
| f | 26.76 | o | 54.26 |
| b | 31.64 | b | 57.06 |
| y | 31.64 | d | 64.97 |
| c | 40.78 | h | 66.56 |
| v | 42.74 | c | 68.85 |
| a | 44.33 | v | 84.81 |
| j | 45.52 | j | 87.41 |
| d | 48.20 | g | 104.25 |
| m | 48.83 | e | 160.26 |
| g | 56.98 | w | 161.79 |
| u | 71.21 | p | 170.98 |
| w | 73.01 | m | 182.58 |
| x | 116.69 | a | 194.17 |
| e | 125.72 | n | 234.22 |
| p | 133.21 | u | 261.52 |
| k | 141.15 | x | 273.88 |
| z | 160.10 | k | 318.89 |
| n | 168.02 | z | 419.52 |
| q | 321.58 | q | 456.54 |
| | 1859.16 | | 3718.32 |

s called u, 11.14; m, 2.79; n, 1.86; a, .93; l, .93; p, .93 ...... 18.58 s
m " p, 35.60; s, 5.08; u, 3.05; r, 2.04; b, 1.02; n, 1.02; y, 1.02  48.83 m
u " n, .59; s, 7.12; r, 3.05; b, 1.02; r, 1.02; .............. 71.21 u
p " m, 125.64; u, 3.03; a, 1.151; s, 1.52; t, 1.51 .........133.21 p
n " u, 160.45; y, 4.55; j, 1.51; s, 1.51; ................168.02 n
    Total
                                                              439.85

These are the five open characters used in the American Braille alphabet. The average number of errors for this group of five is 87.97, as compared with 56.95 for the corresponding group of four in the British alphabet. The errors on them are very unequally divided among the five, s having a little over 4 per cent, m and u together, 27.3 per cent; and p and n together, 68.5 per cent.

The errors on this group of letters in American Braille are mostly of an entirely different kind from those on the British Braille group, k, m, u, and x. In fact they are of a different kind from any of the other errors in the alphabet tests. In British Braille, 64.65 per cent of the errors on the group of four open letters were caused by uncertainty between one and two dots horizontally. In this corresponding American group the errors from this cause make only 8.88 per cent, and of course most of these were confusions between s and the other four letters. The total errors on s, however, were only 18.58, and in the American Braille alphabet test s ranks second in accuracy. The comparison of the rank of American s and British k is striking. While s in American Braille ranks very high, the same character, k in British Braille, ranks considerably lower. Why is there such a difference in the rank of these two identical characters in their respective alphabets? Two more of the open characters, m and u, are alike in the two alphabets. The difference in the two groups and their characteristic errors, then, lies in the fact that the American alphabet has the two open characters, p and n, while the British has the character x. In the British Braille column, page 3, we find the four open letters standing near each other in this order: k, 15th; u, 16th; x, 19th; m 20th; a difference of only five places in all. In the American Braille column, page 13, the five open letters rank in this order: s, 2d; m, 13th; u, 15th; p, 19th; n, 22d; a difference of twenty places in all. In the analysis of the British alphabet we found that the errors on this group were in distinguishing between one and two dots horizontally, and k had a considerable share of these errors. In the American Braille every

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ore care has to be exercised to distinguish $p$ from $m$, and $n$ from $u$; but the difficulty between $m$ and $p$, and $u$ and $n$, is not to distinguish between one and two dots horizontally, because $p$ and $m$ are alike both top and bottom so far as the number of dots is concerned, and so are $u$ and $n$. The difficulty is in distinguishing the slant or position of the single dot in relation to the two dots, and $s$ is not involved in that characteristic difficulty of the other four open letters, $m$ and $p$, $n$ and $u$, and therefore takes a higher place in the American alphabet; while in British Braille the $k$ is involved in the characteristic difficulty of its companions, and so stands near them in rank.

The characteristic error on this American group is one from which the British group and the American $s$ are free; that is, the difficulty of distinguishing between an angle of 90 degrees and an angle of about 60 degrees, when the angles are made of three dots, and one of the dots is twice as far from the other two as they are from each other. In $m$, the lower dot on the left makes a right angle with the upper part. Although in $p$, the lower dot on the right, also really makes a right angle with the upper part on the right-hand side, yet the finger in reading encounters the letter from the *left*, not from the right, unless returning upon the letter, nor from the front as seen by the eye. For easy, accurate, unhindered reading, the characters should be best perceived from an even motion of the finger from the left toward the right, with the finger held in such a position as to cover the upper and lower dots at the same time, without moving the finger up and down, or from right to left, or around over the letters, as when first learning them or examining them individually. In reading the letter $p$, if the finger is at a right angle to the line, or slanting a little towards the left, it will come in contact with the first upper dot of the $p$ before the lower, and if this difference in succession is perceived, it will thereby be distinguished from $m$; but if the finger happens to slant a trifle towards the right, it hits the lower dot of the $p$ simultaneously with the upper dot, and it appears like $m$. The angle or slant made by the lower dot and the upper part, with the vertex at the left, the side from which the finger comes, is about 60 degrees or more, as compared with 90 degrees on $m$. Some readers can scarcely distinguish between these two angles, so nearly alike. $F$ and $d$ have something the same relation. In coming from the left we perceive that the lower dot of the $f$ is directly under the first upper, or vertical. With $d$, we perceive the slant of the lower dot from the first upper, which being 45 degrees, is very perceptible.

Let us notice one more comparison in regard to these open letters in the two American Braille columns, page 22, giving the errors *on* and *involving* each letter respectively. It will be noticed that $m$ and $p$ are several grades apart in the first column, $m$ being six grades higher than $p$, but that they come close together in the second column, $p$ going just above $m$. Also in comparing $u$ and $n$, we find almost the same condition; namely, $u$ is seven grades above $n$, and they come close together in the second column, with $n$ just above $u$. This is due to the fact that $p$ was called $m$ many more times than $m$ was called $p$, and $n$ was called $u$ many more times than $u$ was called $n$. $P$ and $n$ are evidently much poorer characters than $m$ and $u$, and not only are they poor themselves, but their presence in the alphabet greatly impairs the legibility of $m$ and $u$, just as the one-dot $c$ impairs the value of $a$.

One word in regard to the relative seriousness of these two difficulties, one to distinguish between one and two dots horizontally, and the other to distinguish between $p$ and $m$ and $n$ and $u$. It may be said that of course *all* readers *can* distinguish between one and two dots horizontally by taking a bit more time, else they cannot be readers; while this is not quite true of the difficulty on $m$ and $p$, $n$ and $u$, for *some* readers do not, even by careful examination, make sure of the position of the single dot in its relation to the two dots, and yet can read fairly well by context. Although *some* readers do not have trouble with these letters, yet a sufficiently large proportion of readers do have this trouble as to seriously affect results and averages.

4.  $a$ and $c$.  Errors:  $a$ called $e$,  34.54;  $r$, 5.27;  $i$, 3.77;  $o$, .75    total  44.33
    $e$ called $a$  125.72                                              125.72
    ————                                                                    ——
    160.26                                               .              170.05

All the letters except $c$ have one level in common, that is, the top. $E$ being the only letter which does not have that level, it is distinguished from $a$ in straight reading by its slant down from that level. If the reader does not notice the slant which does exist, he calls $c$, $a$. If he imagines a slant which does not exist, he calls $a$, $c$. The degree of slant from this level depends upon the distance that $c$ stands from another letter, and if it is not within hailing distance, it loses its identity entirely. Their confusion with each other greatly impairs the value of each.

5.  $c$, $d$, $f$, $h$ and $g$. The analysis for these letters is so similar to that for the same characters in the British alphabet that it is omitted.

6. *j.* In American Braille, this character stands at the middle of the column of errors, instead of at the foot, as in British Braille. For a five-dot letter, *j* in the American alphabet is unusually fortunate in its companions, for not one of its five dots can be missed and make another letter. The characters which in British Braille stand for *n* and *z* are not in the American alphabet. The different rank which this character takes in these two alphabets affords another illustration of the influence of the characters upon each other.

7. *r.* Errors: *r* called *b*, 12.08; *l*, 6.50; *x*, 6.50; *h*, 5.58; *k*, 4.65; *u*, 6.50; *y*, .93. Total, 42.74.

8. *b* and *y.* Errors: *b* called *r*, 24.35; *h*, 2.43; *o*, 2.43; *y*, 2.43. Total, 31.64.
*y* called *b*, 7.30; *w*, 7.30; *i*, 4.87; *r*, 3.65; *c*, 2.43; *j*, 2.43; *n*, 1.22; *s*, 1.22; *x*, 1.22. Total, 31.64.


## Evidence on Question 2 of the Outline (1913 Report, page 9)

"Are characters of few dots easier to read than characters of many dots?"

### Table Showing Relative Errors and Time in Reading Letters of Few Dots and Many Dots in the American Braille Alphabet Test

| | Total Errors | Average Errors | Average time for reading 60 of each letter* | | Total Errors | Average Errors | Average time for reading 60 of each letter* |
|---|---|---|---|---|---|---|---|
| 1-dot letters | a 44.33 <br> e 125.72 | 85.03 | 25.43 seconds | 4-dot letters | v 42.74 <br> g 56.98 <br> w 73.01 <br> k 141.15 | 78.47 | 39.44 seconds |
| 2-dot letters | o 9.14 <br> s 18.58 <br> t 18.58 <br> i 19.19 <br> r 19.51 | 17.00 | 26.83 " | 5-dot letters | j 45.52 <br> x 116.69 <br> z 160.10 <br> q 321.58 | 160.97 | 54.41 " |
| 3-dot letters | l 19.51 <br> h 26.54 <br> f 26.76 <br> b 31.64 <br> y 31.64 <br> c 40.78 <br> d 48.20 <br> m 48.83 <br> u 71.21 <br> p 133.21 <br> n 168.02 | (38.35) <br> 58.78 | 37.53 " | | Total, 1859.16 | | |

* See 1913 Report, page 45.

The gradations in the foregoing table, both in average errors and in average time are quite uniform from the one-dot, through the two, three, four and five-dot letters, with the exception of the average errors on the two one-dot letters, *a* and *e*, which are more numerous than those on the four-dot group. The average *time*, however, for these one-dot letters is less than for any other group, indicating that the trouble between *a* and *e* affects the accuracy more than it does the speed. That is, the errors on *e* are not of such a nature that lingering on the *e* will make it any more legible, as is the case with other letters. Even the large number of errors against *p* and *n* is not sufficient to make the three-dot group equal to the four-dot group in errors.


## Evidence on Question 5 of the Outline (1913 Report, page 9)

"Are characters which are alike except for their position in the line a hindrance in reading?" As seen in the table on few and many dots, above, the evidence in this alphabet test is that the letters which are alike except for their level in the line, were a *great* hindrance to accuracy, and some hindrance to speed, for the time on the *e* sheet was considerably greater than on the *a* sheet; and while the average time for the two sheets is less than for any other group, the time on the *e* sheet alone was more than the average for the two-dot group; while the average *errors* on *a* and *e* were more than for the four-dot group. (The *a* sheet tested *a* without *e*, but the *e* sheet tested *e* with *a*.)

This is the evidence drawn from this alphabet test in which there is only one character in the lower

level, but there are three low-level part-word contractions in the American Braille System which are subject to the same conditions; and five low-level whole-word signs were authorized in this system, but as they were decidedly disapproved by the Uniform Type Committee in the first report, 1907, they have since been discontinued by some presses. (See 1907 Report, page 13.)

In the British Braille there are no low-level single letters, so that alphabet test was entirely free from this difficulty, but there are several low-level part-word contractions used in British Braille, and low-level, whole-word signs, so although no evidence on this question was given in the British alphabet test, yet the British system is burdened with this difficulty.

### Conclusions on the American Braille Alphabet Test

From this analysis it appears that there were four principal causes of errors on the American Braille alphabet test, as follows:

*First*—The general similarity of shape between the three five-dot letters, $q$, $x$ and $z$, causing mutual confusions between them. This cause of error did not exist in the British alphabet test, as only one of these forms is used in the British alphabet.

*Second*—Uncertainty as to the presence or absence of corner dots in these same letters, causing mutual confusion between these three letters with $k$ and $w$. In British Braille this special kind of confusion was limited to two letters, $q$ and $r$, while in American Braille it involved five letters, $q$, $x$, $z$, $k$ and $w$, and was, therefore, a much more prolific cause of error. As in British Braille, uncertainty as to the presence or absence of corner dots in $d$, $c$ and $g$ was also a cause of the same kind or error.

*Third*—Similarity of shape between $m$ and $p$, and $u$ and $n$, the very slight difference in the position of the lower dot in $m$ and $p$, and of the upper dot in $u$ and $n$, being a very prolific cause of error from which the British alphabet was free. On the other hand, American Braille had comparatively little confusion between one and two dots horizontally in these open letters, which was the cause of quite a large proportion of errors in British Braille. The difficulty of distinguishing between $m$ and $p$, and $u$ and $n$ in American Braille was, however, greater than between one and two dots in the British Braille open letters, $m$, $u$, $k$ and $x$.

*Fourth*—The presence of two one-dot letters in the alphabet, differing only in position. The British alphabet test was free from this cause of error, but it exists to some extent in the New York Point alphabet.

## Analysis of Errors on the New York Point Alphabet Test

### Characters Used

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

(braille characters shown)

| n | o | p | q | r | s | t | u | v | w | x | y | z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

(braille characters shown)

Following is a list of errors on the New York Point Alphabet test:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i | called | a | 226.31 | u | called | q | 8.00 | v | called | f | 2.74 | a | called | u | 1.41 |
| a | " | f | 79.91 | c | " | a | 7.78 | g | " | h | 2.74 | z | " | b | 1.38 |
| v | " | y | 76.65 | o | " | s | 7.40 | k | " | j | 2.74 | h | " | c | 1.38 |
| n | " | u | 75.91 | o | " | r | 7.39 | v | " | j | 2.74 | z | " | c | 1.38 |
| m | " | b | 75.59 | o | " | w | 7.39 | v | " | s | 2.74 | z | " | d | 1.38 |
| h | " | z | 60.58 | a | " | n | 7.06 | g | " | x | 2.74 | z | " | v | 1.38 |
| b | " | m | 51.57 | d | " | z | 6.97 | j | " | b | 2.27 | h | " | j | 1.38 |
| w | " | g | 43.29 | z | " | k | 6.89 | s | " | o | 2.20 | v | " | a | 1.37 |
| k | " | c | 38.33 | q | " | k | 6.87 | s | " | i | 2.20 | v | " | c | 1.37 |
| k | " | d | 38.33 | k | " | z | 6.85 | i | " | m | 2.06 | g | " | d | 1.37 |
| z | " | h | 35.79 | g | " | r | 6.84 | x | " | l | 2.05 | g | " | m | 1.37 |
| j | " | z | 35.26 | j | " | g | 6.83 | x | " | z | 2.05 | g | " | o | 1.37 |
| q | " | l | 34.40 | j | " | h | 5.69 | d | " | c | 1.74 | g | " | z | 1.37 |
| j | " | v | 32.99 | j | " | m | 5.69 | d | " | s | 1.74 | k | " | h | 1.37 |
| l | " | q | 30.53 | a | " | e | 5.65 | d | " | t | 1.74 | k | " | v | 1.37 |
| t | " | c | 27.97 | h | " | g | 5.50 | r | " | w | 1.74 | y | " | u | 1.37 |
| r | " | g | 27.90 | k | " | g | 5.47 | q | " | u | 1.72 | v | " | p | 1.37 |
| y | " | v | 26.01 | g | " | k | 5.47 | q | " | g | 1.71 | v | " | w | 1.37 |
| u | " | n | 23.98 | k | " | x | 5.47 | b | " | i | 1.71 | v | " | z | 1.37 |
| g | " | q | 23.27 | p | " | l | 4.65 | q | " | m | 1.71 | j | " | x | 1.14 |
| n | " | a | 19.97 | w | " | y | 4.65 | b | " | p | 1.71 | j | " | p | 1.14 |
| c | " | s | 18.55 | l | " | r | 4.37 | q | " | p | 1.71 | j | " | l | 1.14 |
| f | " | u | 17.66 | m | " | o | 4.36 | q | " | r | 1.71 | j | " | k | 1.14 |
| w | " | o | 16.99 | k | " | q | 4.11 | b | " | w | 1.71 | j | " | i | 1.14 |
| g | " | w | 16.43 | i | " | a | 4.10 | q | " | w | 1.71 | j | " | c | 1.14 |
| c | " | t | 16.26 | n | " | t | 4.00 | c | " | d | 1.55 | s | " | f | 1.11 |
| u | " | f | 15.99 | n | " | w | 4.00 | c | " | f | 1.55 | s | " | r | 1.11 |
| d | " | k | 15.71 | q | " | b | 3.44 | c | " | y | 1.55 | s | " | t | 1.11 |
| z | " | j | 13.77 | s | " | l | 3.31 | c | " | w | 1.55 | s | " | v | 1.11 |
| s | " | c | 13.27 | p | " | b | 3.09 | c | " | o | 1.55 | s | " | x | 1.11 |
| j | " | d | 12.51 | p | " | q | 3.09 | w | " | p | 1.54 | s | " | z | 1.11 |
| g | " | j | 10.95 | w | " | r | 3.09 | w | " | s | 1.54 | f | " | v | 1.11 |
| r | " | o | 10.46 | p | " | s | 3.09 | p | " | w | 1.54 | i | " | e | 1.01 |
| x | " | k | 10.20 | x | " | p | 3.06 | p | " | c | 1.54 | i | " | f | 1.01 |
| s | " | p | 9.95 | m | " | l | 2.90 | w | " | l | 1.54 | i | " | s | 1.01 |
| h | " | x | 9.64 | m | " | p | 2.90 | m | " | d | 1.45 | i | " | y | 1.01 |
| c | " | k | 9.26 | l | " | s | 2.90 | m | " | i | 1.45 | x | " | j | 1.01 |
| c | " | z | 9.26 | z | " | a | 2.75 | l | " | m | 1.45 | x | " | w | 1.01 |
| d | " | i | 8.72 | z | " | g | 2.75 | l | " | p | 1.45 | a | " | o | .71 |
| r | " | h | 8.72 | h | " | r | 2.75 | l | " | x | 1.45 | | | | |
| y | " | o | 8.21 | z | " | w | 2.74 | l | " | y | 1.45 | Total, | | | 1673.99 |
| x | " | h | 8.15 | k | " | b | 2.74 | m | " | y | 1.45 | | | | |

In the above list, the errors between second and third-base amount to 51.43 per cent of the total errors as compared with 10.8 per cent of the errors on the American Braille alphabet, and 13 per cent of the errors on the British alphabet, caused by confusions between tall and short letters. On the New York Point alphabet test, the number of different errors was 165, as compared with 174 on the American Braille and 211 on the British Braille. "This seems to indicate" that in the New York Point and American Braille the errors were more concentrated upon the special difficulties and characteristic errors of those systems than they were in the British alphabet.

As an aid in the analysis of these errors, the numbers against each letter are arranged in the following two columns, side by side.

The first column gives the number of errors on each letter in the numerical order of the errors, and the second column gives the number of errors involving each letter.

In comparing the two columns, we find that $i$, the vertical two-dot letter, stands at the top of both columns, while the horizontal two-dot letter, $a$, stands low in the first column, and goes to the very foot of the second column. Its low position in the first column is owing to its having been called $f$ many times, and its going still lower in the second column is owing to $f$ having been called $a$ even many more times than $a$ was called $f$. While $e$ and $t$, the two one-dot letters, do not stand as high in the first column as the one-dot letter does in the British Alphabet, page 18, yet they stand considerably higher than $a$ and $e$ do in the American Braille column, page 22. For further comparison between $a$ and $i$ with $e$, see the analysis on British Braille, page 18. These characters are there discussed in relation to all three of the systems.

### New York Point Alphabet

| Errors on each letter | | Errors involving each letter | |
|---|---|---|---|
| i | 10.20 | i | 25.42 |
| p | 17.00 | p | 38.77 |
| o | 22.18 | x | 49.08 |
| e | 24.04 | t | 51.08 |
| x | 27.53 | e | 58.67 |
| t | 27.97 | o | 68.03 |
| d | 36.62 | r | 76.08 |
| s | 37.59 | s | 76.56 |
| y | 38.33 | d | 93.21 |
| l | 43.60 | l | 93.59 |
| c | 44.82 | c | 104.97 |
| u | 47.97 | w | 113.83 |
| r | 48.82 | y | 125.09 |
| q | 54.98 | q | 127.04 |
| b | 56.70 | n | 134.92 |
| z | 67.47 | j | 140.67 |
| w | 72.64 | h | 143.69 |
| g | 73.92 | b | 145.21 |
| h | 81.23 | u | 146.04 |
| m | 90.10 | m | 153.95 |
| v | 91.72 | v | 155.69 |
| a | 94.74 | k | 162.32 |
| n | 103.88 | g | 167.37 |
| k | 106.78 | z | 192.29 |
| j | 108.08 | f | 347.39 |
| f | 245.08 | a | 357.02 |
| | 1673.99 | | 3347.98 |

### Special Analysis for Each Letter in the New York Point Alphabet Test

1. $a$ and $f$. Errors: $f$ called $a$, 226.31; $u$, 17.66; $v$, 1.11. Total, 245.08 $f$
$a$ called $f$, 79.91; $n$, 7.06; $e$, 5.65; $u$, 1.41; $o$, .71    "    94.74 $a$

    "    339.82

$F$ called $a$ was the most frequent error in the New York Point alphabet test; and $a$ called $f$ was the next most frequent.

2. $n$ and $u$. Errors: $u$ called $n$, 23.98; $f$, 15.99; $q$, 8.00  Total,  47.97 $u$
$n$ called $u$, 75.91; $a$, 19.97; $t$, 4.00; $w$, 4.00    "    103.88 $n$

    "    151.85

3. $m$ and $b$. Errors: $m$ called $b$, 75.59; $e$, 4.36; $l$, 2.90; $p$, 2.90; $d$, 1.45; $i$, 1.45; $y$, 1.45    Total, 90.10 $m$
$b$ called $m$, 51.57; $i$, 1.71; $p$, 1.71; $w$, 1.71.    "    56.70 $b$

    "    146.80

4. $l$ and $q$. Errors: $q$ called $l$, 34.40; $k$, 6.87; $b$, 3.44; $g$, 1.71; $m$, 1.71; $p$, 1.71; $r$, 1.71; $u$, 1.72; $w$, 1.71    Total, 54.98 $q$
$l$ called $q$, 30.53; $r$, 4.37; $s$, 2.90; $m$, 1.45; $p$, 145; $x$, 1.45; $y$, 1.45    "    43.60 $l$

    "    98.58

In these four paragraphs, by far the most frequent errors are the mutual confusions on account of the two and three dots placed in horizontal succession.

5. $k$ and $d$. Errors: $k$ called $d$, 38.33; $c$, 38.33; $z$, 6.85; $g$, 5.47; $x$, 5.47; $q$, 4.11; $b$, 2.74; $j$, 2.74; $h$, 1.37; $v$, 1.37    Total, 106.78 $k$
$d$ called $k$, 15.71; $i$, 8.72; $z$, 6.97; $c$, 1.74; $s$, 1.74; $t$, 1.74    "    36.62 $d$

143.40

$K$ has two equally characteristic errors, namely $k$ called $d$, confusing it with the corresponding second-base letter, by mistaking three dots for two horizontally, and $k$ called $c$, the corresponding third-base letter, by missing the right upper corner dot.

6. $r$ and $g$. Errors: $g$ called $q$, 23.27; $w$, 16.43; $j$, 10.95; $r$, 6.84; $k$, 5.47; $h$, 2.74; $x$, 2.74; $d$, 1.37; $m$, 1.37; $e$, 1.37; $z$, 1.37    Total,  73.92 $g$
$r$ called $g$, 27.90; $e$, 10.46; $h$, 8.72; $w$, 1.74;    "    48.82 $r$

122.74

7. Further analysis of $q$, $b$, $g$, $k$, and $d$, $l$, $r$, $m$.

| | | | | | Mutual Confusions between | $g$ and $r$ | 34.71 |
|---|---|---|---|---|---|---|---|
| Total, | 54.98 $q$ | Total, | 36.62 $d$ | | "    "    " | $k$ and $d$ | 54.01 |
| " | 56.70 $b$ | " | 43.60 $l$ | | "    "    " | $q$ and $l$ | 64.93 |
| " | 73.92 $g$ | " | 48.82 $r$ | | "    "    " | $b$ and $m$ | 127.16 |
| " | 106.78 $k$ | " | 90.10 $m$ | | | | |

| Total, | 292.38 | Total, | 219.14 | | | Total, 280.87 |
|---|---|---|---|---|---|---|

We notice a wide difference in the total errors between $q$ and $k$, with $b$ having only a very slight difference from $q$, and $g$ intermediate between the two extremes. In this group, $q$, $b$, $g$, $k$, we find three kinds of characteristic errors, namely, confusions with corresponding second-base letters, confusions with corresponding third-base letters, and mutual confusions with each other. The most numerous errors are the confusions with the corresponding second-base letters.

The only decidedly characteristic error on the second-base letters is their confusion with the corresponding third-base letters; $m$ called $b$ 75.59 times is by far the most frequent error on this group of triangles, and $b$ called $m$ 51.57 times is the most frequent error on the corresponding group of third-base letters.

It will be noticed that although $g$ and $k$ have the largest number of total errors, yet $q$ and $b$ have the largest number of confusions with the second-base letters. This is because the total errors on $g$ and $k$ are made up of three kinds of characteristic errors (besides several lesser ones), while the errors on $q$ and $b$ are principally of the one kind namely confusions with second-base letters. $G$ and $k$ not only have the characteristic confusion with second-base to contend with, but the corner dot in this pair of letters is at the right or last end, where it causes many errors, and causes confusion with $w$ and $c$. There is very little confusion between $q$ and $p$ because the corner dot is at the first or left end, where it is more distinctly perceived. The missing of a corner dot in $b$ does not give another letter, but even if it did, the evidence is very strong that there would have been very little confusion between $b$ and that character, which is used for the word *the* in New York Point. $K$ and $g$ had an equal chance for the mutual confusions with the corresponding third-base letters, $c$ and $w$, or the mutual confusions with the corresponding second-base letters, $d$ and $r$. The former amount to 107.31 errors, with the trouble on a right hand corner dot, and the latter to 79.88 errors, with the trouble between two and three dots horizontally. So here again we see that the uncertainty on the right hand corner dots is very appreciable. Perhaps the very effort not to make mistakes on the right hand corner dots in $k$ and $g$ helped to prevent their making more between two and three dots horizontally on this pair; for this pair had less than half as many mutual confusions with the second-base letters as the other pair with the corner dot at the left. But even this is not sufficient to make the *total* errors on $b$ and $q$ as many as on $g$ and $k$; for $g$ and $k$ have two real difficulties to contend with, while $b$ and $q$ have practically only one of much importance. There were more errors occasioned by this one cause in the New York Point alphabet than by any other. This is the difficulty of determining the relative length of the characters in this position. As the errors between $a$ and $f$ (see paragraph 1, page 23) were many more than between either of these pairs of second and third-base letters, it seems that the uprights, or dots in vertical position help to make the length more definite. This may be especially noticed in the case of the letter $x$ in New York Point, which has an upright at each end, and had many less errors than any other letter having three dots in horizontal succession.

8. $c$, $p$, $w$. Errors: $p$ called $l$, 4.65; $b$, 3.09; $q$, 3.09; $s$, 3.09; $c$, 1.54; $w$, 1.54

$c$ called $s$, 18.55; $k$, 9.26; $z$, 9.26; $d$, 1.55; $f$, 1.55; $c$, 1.55; $w$, 1.55; $y$, 1.55

$w$ called $g$, 43.29; $c$, 16.99; $y$, 4.65; $r$, 3.09; $l$, 1.54; $p$, 1.54; $a$, 1.54

| | |
|---|---|
| Total, | 17.00 $p$ |
| " | 44.82 $c$ |
| " | 72.64 $w$ |

Total, 134.46

The confusion of $c$ with $k$, and $w$ with $g$ are characteristic errors for this group, but are given under $k$ and $g$ in paragraph 7. A reason for the few errors on $p$ is also found in paragraph 7.

9. $h$ and $z$ . Errors: $z$ called $h$, 35.79; $j$, 13.77; $k$, 6.89; $a$, 2.75; $g$, 2.775; $b$, 1.38; $c$, 1.38; $d$, 1.38; $r$, 1.38

$h$ called $z$, 60.58; $x$, 9.64; $g$, 5.50; $r$, 2.75; $c$, 1.38; $j$, 1.38

| | |
|---|---|
| Total, | 67.47 $z$ |
| " | 81.23 $h$ |

The most characteristic error on these third-base five-dot letters is mutual confusion with each other by misplacing the first dot or reversing up and down. Their confusion with second-base letters are very few, showing that it is not as difficult to determine their length accurately as it is with $f$ and $u$, and $b$, $q$, $k$, and $g$.

10.  *v* and *y*.  Errors: *y* called *v*, 26.01; *c*, 8.21; *w*, 2.74; *u*, 1.37      Total,  38.33  *y*
   *v* called *y*, 76.65; *f*, 2.74; *j*, 2.74; *s*, 2.74; *a*, 1.37; *c*, 1.37; *p*, 1.37; *w*, 1.37; *z*, 1.37  "   91.72  *v*

11.  *j*.  Errors: *j* called *z*, 35.26; *v*, 32.99; *d*, 12.51; *g*, 6.83; *h*, 5.69; *m*, 5.69;
   *b*, 2.27; *c*, 1.14; *i*, 1.14; *k*, 1.14; *l*, 1.14; *p*, 1.14; *x*, 1.14      "   108.08  *j*

There was a greater variety of errors on *j* than on any other one letter.  Most of the errors were caused by adding the lower right hand corner dot and calling it *z*.  Almost as many were caused by missing the middle dot and calling it *v*.  The next most frequent error was missing the last dot and calling it *d*.  The last or right hand dot was missed more than twice as many times as the first or left hand dot, affording another illustration of the clearer perception of the left hand side of the letters than of the right hand side in reading, when the approach is from the left.

12.  *x*.  Errors: *x* called *k*, 10.20; *b*, 8.15; *q*, 3.06; *l*, 2.05; *z*, 2.05; *j*, 1.01; *w*, 1.01  Total,  27.53  *x*

X stood the test better than any other five-dot letter in either of the three alphabets, and better than any other letter with three dots in horizontal succession.  The total errors on *x* were comparatively few, and of these few errors, the confusions with second-base made only 7.45 per cent.  In beginning this analysis, we began with *f* (page 27), which evidently presents the greatest difficulty in determining the third-base length accurately.  Of the letters which have three dots in horizontal succession, *f* stands at one extreme with very many errors, and *x* at the other extreme with very few errors; and the four-dot group, *q*, *b*, *k*, *g*, intermediate between these extremes.  Comparing these letters, *f*, with the group *q*, *b*, *g*, *k*, and with *x*, we notice that *f*, having nothing except the three dots in horizontal succession, had 226.31 errors on length; that the intermediate group, having in addition to the three dots in horizontal succession, one dot at one end in vertical position, had the average errors on length for this group, 35.09; and that *x* having in addition to the three dots in horizontal succession, one dot at *each* end in vertical position, had only 2.05 errors on length.

13.  *o* and *s*.  *o* total, 22.18,  *s* total, 37.59

The larger number of errors on *s* than on *o* is accounted for by the fact that *s* had two corresponding third-base letters to contend with, namely *c* and *p*, while *o* had only one, *w*.  The other corresponding third-base character is a contraction for the word *the*, and in the word test taken since the 1913 Convention, *o* and *the* were confused with each other.  This is another illustration of the fact that in judging of the relative legibility of characters, it is necessary to consider what other characters may come in competition with them in the system.

14.  *c* and *t*.  Errors: *c* called *t*, 16.26; *a*, 7.78      Total, 24.04  *c*
         *t* called *c*, 27.97;  .       "   27.97  *t*

Although these are one-dot letters, yet they do not stand as high in their own alphabets, amongst their own companions, as *a* stands in the British alphabet amongst its companions in that alphabet.

15.  *i*.  On the whole, *i* stood the test the best of any letter in the New York Point alphabet.  It had the fewest errors of its own and was involved in the fewest errors on other letters, and the reasons for this are evident.  It is not subject to any of the special causes of error, either of level, or length, or of corner dots, or right and left sides.  In New York Point this character is the freest from all complications.  For further comparison of this character with other characters, see page 18.

"Are characters of few dots easier to read than characters of many dots?"

## Table Showing the Relative Errors and Time in Reading Letters of Few and Many Dots in the New York Point Alphabet Test

| | Total errors | Average errors | Average time for reading 60 of each letter* | | Total errors | Average errors | Average time for reading 60 of each letter* |
|---|---|---|---|---|---|---|---|
| 1-dot letters { c | 24.04 } | 26.00 | 25.48 seconds | 4-dot letters { q 54.98, b 56.70, g 73.92, k 106.78, j 108.08 } | | 80.09 | 41.24 seconds |
| 1-dot letters { t | 27.97 } | | | | | | |
| 2-dot letters { i | 10.20 | 53.72 | 27.66 " | 5-dot letters { x 27.53, z 67.47, h 81.23 } | | 58.74 | 40.35 " |
| o | 22.18 | | | | | | |
| s | 37.59 | | | | | | |
| a | 94.74 | | | Total, 1673.99 | | | |
| n | 103.88 } | | | | | | |
| 3-dot letters { p | 17.00 | (50.16) 67.88 | 35.24 " | | | | |
| d | 36.62 | | | | | | |
| y | 38.33 | | | | | | |
| l | 43.60 | | | | | | |
| c | 44.82 | | | | | | |
| u | 47.97 | | | | | | |
| r | 48.82 | | | | | | |
| w | 72.64 | | | | | | |
| m | 90.10 | | | | | | |
| v | 91.72 | | | | | | |
| f | 245.08 } | | | *See 1913 Report, page 45. | | | |

It will be seen that *f* has an exceptionally large number of errors in the three-dot group. The average number of errors for the three-dot letters without *f* is 50.16, while with *f* the average for the whole group is 67.88. The relatively small number of errors on the five-dot letters is also noticeable, the average for this group being less than for the three-dot group. For reasons, see pages 25 and 26.

### Evidence on Question 3 of the Outline

"Are characters similar in shape more easily read if placed horizontally in a two-level line, or vertically in a three-level line?"

In the British and American Braille alphabets combined, the confusions between tall and short letters made 11.36 per cent of the total errors, while in the New York Point alphabet the confusions between second and third-base letters made 54.43 per cent of the total errors. In the two Braille alphabets combined, within the limits of the upper two-thirds of the cell, two dots in height and two dots in width, there were 247 per cent more errors on width than on height. In the New York Point alphabet, within the limits of two dots in height and two dots in width, there were 786 per cent more errors on width than on height.

### Conclusion of the New York Point Alphabet Test

From this analysis it appears that the principal cause of errors in the New York Point alphabet test was the difficulty of distinguishing between second and third-base letters, especially when the third-base has three dots in horizontal succession.

In this connection it will be noticed that *f* and *a*, and *u* and *n*, in the horizontal position correspond with *l* and *b* in the vertical position in British Braille, and *l* and *t*, in American Braille, and that the New York Point *b*, *q*, *k*, and *g*, correspond with *p* and *v* in British Braille; and that although the errors on length in the horizontal position were very common, the errors on the height of the corresponding characters in the vertical position were few. This experience corresponds with ordinary practical affairs not connected with reading, for to judge most quickly and accurately of the comparative length of two things we place them side by side, and not end to end.

## Analysis of Errors on Tests of Single Word-signs in the Three Systems, British Braille, American Braille and New York Point, Taken Since the 1913 Convention

In considering these tests, one of the first questions, that naturally arise, is "How do these tests compare with each other?"  Another question is, "How do they compare with the alphabet tests?" and still another, "What further light do they shed on the relative legibility of the different characters?"

In seeking the answers to these three questions, we cannot keep them entirely distinct, although in the main we may divide the analysis into three parts, corresponding to the three questions; taking

*First*, some general comparisons with each other and with the alphabet tests.  In the Braille systems the test did not include low-level and two-cell signs, but only single-cell whole-word signs having dots in the upper and left hand rows.  The only word-sign of this kind *not* included was *sh* standing for *shall* in British Braille.  In New York Point the word-signs within the limits of the third-base were used.

The conditions for the word tests differed from those of the alphabet tests in three respects; first, in the pronouncing of words instead of single letters; second, in the spacing; and third, in part of the characters used.

The pronouncing of the words probably had some effect to retard the general rapidity of the reading, although not as much as might at first be supposed, for a comparison of the letters and words shows that quite a large proportion of the words can be pronounced as quickly as the letters, and several more almost as quickly, while the remainder, having more than one consonant or more than one syllable must take longer.

The British Braille word test took nearly 9 per cent more time than its alphabet test, while the American Braille word test took 13 1-3 per cent less time than its alphabet test, and the New York Point word test took 5 per cent less time than its alphabet test, each reckoned in proportion to the number of characters read.

The difference in the *spacing* and in the *characters* used, both produced very marked differences in the results on *some* of the letters, but not on all.

In regard to the *spacing*, the word-signs were all spaced apart with the width of a word-space between them, while the alphabet tests had the letters in groups of three, four, or five letters together.  The open spacing was especially helpful with the many-dot letters in Braille, the errors being less with the open spacing than with the close groups; and in New York Point it was evidently helpful in distinguishing between second and third-base letters, as *a* and *f*.  The open spacing however caused more difficulty in determining the *level* in New York Point; and in British Braille it probably made it more difficult to distinguish between *k*, *ch*, and *st* as whole-word signs standing alone than would be the case with close spacing as part-word signs, but as *ch* and *st* did not occur in the alphabet test, *k* was not subjected to this competition or influence there, so no direct comparison can be made.  These, however, are exceptional cases, and the effect of the open spacing was as a whole very helpful.  One illustration of the benefit which may reasonably be attributed to the open spacing is afforded in British Braille by *q* and *r*.  The mutual confusions between *q* and *r* in the word test were less than one-third as many as in the close groups of the alphabet test.  There are many other similar illustrations, in this and the other word tests.  This has a decided bearing on the selection of characters for use in groups, as letters and letter-groups in words, or as single whole-word signs standing alone.

In regard to the *characters* used, the letters which do not stand for words were omitted in the word tests, and other characters which do stand for words were added.  This gives a difference of competition between characters, as it might be called, or a difference in the influence upon the reading caused by the presence or absence of certain characters.  Since in the British Braille, all the letters stand for words, this competition between characters was simply *increased* in the word test by the addition of 10 more characters making 36.  But in American Braille and New York Point the competition between characters was *decreased* as a whole, although it was *increased* for certain letters.  Namely, in American Braille the confusion between characters was decreased by the omission of four letters (*c*, *p*, *x* and *z*, all of which had caused many errors in the alphabet test), and *increased* by the addition of 10 other characters (only one of which, *th*, was very troublesome), making 32 in all.  In New York Point the competition was greatly *decreased* by the omission of 9 letters (*d*, *e*, *l*, *m*, *q*, *r*, *t*, *x*, and *z*), and somewhat *increased* by the addition of 6 other characters, making 23 in all.  There was then a greater variety of characters and more competition between characters in the British Braille word test than in the others.

Comparing the two Braille word tests with each other, we find that 27 of the characters used were the same in these two tests.  So the difference between these two tests was in the 9 extra characters of the British Braille which did not appear in the American, and the 5 extra characters of the American Braille which did not appear in the British.  A close comparison of these 9 characters with the 5, shows plainly

that the British test including 36 characters was really a more difficult one in its competition between characters, than the American Braille test; and there were nearly twice as many errors in proportion to the number of characters read as in the American Braille test. This British Braille word test came nearer to using all the characters found in reading than either of the others. The British Braille had 36 out of the 44 full height and upper level characters which are used as letters or contractions, while the American Braille test had 32 out of 44 such characters including American Braille e; and New York Point had 23 out of 38 characters which are used as letters or contractions. Reducing these three ratios to a common basis, in order to compare them, we see that the British Braille had 82 per cent of the total number, American Braille 73 per cent and New York Point only 61 per cent.

*Second.* A comparison of the single-cell word test with the alphabet test in each system.

## BRITISH BRAILLE WORD TEST

### List of Characters and Words Used

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| a | but | can | do | every | from | go | have | I | just |

| k | l | m | n | o | p | q | r | s | t |
|---|---|---|---|---|---|---|---|---|---|
| knowledge | like | more | not | O | people | quite | rather | so | that |

| u | v | x | y | z | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| us | very | it | you | as | and | for | of | the | with |

| oh | st | | th | wh | | | ou | | w |
|---|---|---|---|---|---|---|---|---|---|
| child | still | | this | which | | | out | | will |

There are six other characters considered in the analysis but not included in the test as follows:

| ow | ar | gh | ed | ble | er |
|---|---|---|---|---|---|

In reading the sheets, of course, all the characters were pronounced as words, but in the analysis of the errors, they are recorded and alluded to as letters or characters, for the errors were those of mistaking one character for another, for instance, when *quite* was called *rather*, the error was simply mistaking *q* for *r*, and is so recorded in the list of errors.

Following is a list of the errors on the British Braille single-cell word test:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| o | called | n | 42.25 | x | called | d | 1.69 | w | called | out | 42.25 |
| z | " | y | 35.49 | d | " | e | 1.69 | x | " | and | 35.49 |
| j | " | h | 28.73 | f | " | e | 1.69 | w | " | with | 30.42 |
| o | " | z | 23.66 | h | " | e | 1.69 | ou | " | of | 21.97 |
| y | " | z | 23.66 | g | " | f | 1.69 | of | " | r | 21.97 |
| q | " | r | 18.59 | h | " | f | 1.69 | of | " | ou | 20.28 |
| z | " | o | 13.52 | i | " | f | 1.69 | for | " | q | 20.28 |
| m | " | x | 13.52 | q | " | f | 1.69 | y | " | for | 18.59 |
| u | " | x | 13.52 | v | " | f | 1.69 | r | " | of | 16.90 |
| e | " | d | 11.83 | f | " | g | 1.69 | for | " | of | 16.90 |
| y | " | n | 11.83 | q | " | g | 1.69 | with | " | of | 16.90 |
| j | " | b | 10.14 | a | " | i | 1.69 | y | " | and | 15.21 |
| g | " | h | 10.14 | j | " | i | 1.69 | of | " | for | 13.52 |
| a | " | e | 8.45 | o | " | i | 1.69 | th | " | wh | 13.52 |
| h | " | j | 8.45 | s | " | i | 1.69 | for | " | with | 11.83 |
| g | " | n | 8.45 | x | " | i | 1.69 | with | " | w | 10.14 |
| u | " | v | 8.45 | g | " | j | 1.69 | of | " | z | 10.14 |
| f | " | a | 6.76 | w | " | j | 1.69 | wh | " | th | 10.14 |
| k | " | e | 6.76 | z | " | j | 1.69 | and | " | for | 8.45 |
| u | " | z | 6.76 | n | " | k | 1.69 | t | " | with | 8.45 |
| l | " | b | 5.07 | k | " | m | 1.69 | of | " | with | 8.45 |
| f | " | d | 5.07 | p | " | m | 1.69 | ou | " | r | 6.76 |
| d | " | f | 5.07 | z | " | n | 1.69 | the | " | z | 6.76 |
| p | " | f | 5.07 | j | " | o | 1.69 | the | " | with | 6.76 |
| v | " | h | 5.07 | c | " | p | 1.69 | th | " | p | 5.07 |
| k | " | l | 5.07 | m | " | p | 1.69 | ou | " | w | 5.07 |
| n | " | o | 5.07 | q | " | p | 1.69 | z | " | the | 5.07 |
| z | " | r | 5.07 | g | " | q | 1.69 | with | " | the | 5.07 |
| x | " | u | 5.07 | n | " | q | 1.69 | q | " | with | 5.07 |
| k | " | x | 5.07 | p | " | q | 1.69 | p | " | th | 5.07 |
| i | " | e | 3.38 | y | " | q | 1.69 | w | " | wh | 5.07 |
| b | " | f | 3.38 | g | " | r | 1.69 | z | " | wh | 5.07 |
| u | " | h | 3.38 | h | " | r | 1.69 | wh | " | c | 3.38 |
| e | " | i | 3.38 | v | " | r | 1.69 | wh | " | s | 3.38 |
| w | " | l | 3.38 | o | " | s | 1.69 | and | " | v | 3.38 |
| u | " | m | 3.38 | t | " | s | 1.69 | wh | " | z | 3.38 |
| x | " | m | 3.38 | n | " | t | 1.69 | p | " | and | 3.38 |
| d | " | n | 3.38 | q | " | t | 1.69 | v | " | and | 3.38 |
| k | " | n | 3.38 | c | " | u | 1.69 | w | " | and | 3.38 |
| a | " | o | 3.38 | k | " | u | 1.69 | with | " | for | 3.38 |
| r | " | o | 3.38 | l | " | v | 1.69 | s | " | the | 3.38 |
| r | " | q | 3.38 | p | " | v | 1.69 | f | " | th | 3.38 |
| o | " | r | 3.38 | j | " | w | 1.69 | ou | " | wh | 3.38 |
| p | " | s | 3.38 | q | " | w | 1.69 | th | " | d | 1.69 |
| s | " | t | 3.38 | z | " | x | 1.69 | of | " | h | 1.69 |
| v | " | u | 3.38 | h | " | y | 1.69 | ou | " | h | 1.69 |
| z | " | u | 3.38 | l | " | y | 1.69 | of | " | k | 1.69 |
| y | " | w | 3.38 | n | " | z | 1.69 | with | " | n | 1.69 |
| e | " | x | 3.38 | | | | | and | " | p | 1.69 |
| n | " | y | 3.38 | | | | 515.45 | the | " | s | 1.69 |
| m | " | b | 1.69 | | | | | ou | " | u | 1.69 |
| g | " | d | 1.69 | with | called | t | 79.43 | of | " | v | 1.69 |
| j | " | d | 1.69 | q | " | for | 43.94 | and | " | x | 1.69 |

| | | | |
|---|---|---|---|
| ou | called | x | 1.69 |
| and | " | y | 1.69 |
| with | " | z | 1.69 |
| h | " | and | 1.69 |
| z | " | and | 1.69 |
| of | " | and | 1.69 |
| the | " | and | 1.69 |
| wh | " | and | 1.69 |
| x | " | for | 1.69 |
| d | " | of | 1.69 |
| n | " | of | 1.69 |
| u | " | of | 1.69 |
| v | " | of | 1.69 |
| z | " | of | 1.69 |
| and | " | of | 1.69 |
| and | " | the | 1.69 |
| th | " | the | 1.69 |
| e | " | with | 1.69 |
| r | " | with | 1.69 |
| and | " | with | 1.69 |
| th | " | with | 1.69 |
| g | " | th | 1.69 |
| q | " | th | 1.69 |
| y | " | th | 1.69 |
| z | " | th | 1.69 |
| ou | " | th | 1.69 |
| e | " | wh | 1.69 |
| s | " | wh | 1.69 |
| with | " | wh | 1.69 |
| d | " | ou | 1.69 |
| u | " | ou | 1.69 |
| wh | " | ou | 1.69 |
| | | | 664.17 |
| k | called | st | 206.18 |
| k | " | ch | 184.21 |
| ch | " | st | 131.82 |
| st | " | ch | 101.40 |
| st | " | k | 81.12 |
| ch | " | k | 20.28 |
| st | " | i | 5.07 |
| ch | " | e | 3.38 |
| s | " | st | 3.38 |
| ch | " | j | 1.69 |
| ch | " | x | 1.69 |
| ch | " | y | 1.69 |
| st | " | th | 1.69 |
| u | " | st | 1.69 |
| v | " | st | 1.69 |
| | | | 746.98 |
| | | Total, | 1926.60 |

In spite of the open spacing, the total number of errors in proportion to the number of characters read in the British word test was more than in the alphabet test, owing to the increased confusion or competition between different characters. But there were a little less than half as many errors on the 26 letters with the open spacing as in the close groups of the alphabet test. This decrease in errors on the letters as compared to the alphabet test must be due to the open spacing more than to any other cause. Only 5 letters had more errors in the word test than in the alphabet test, namely, a, o, e, w, and k; the error on k especially being greatly increased by confusion with ch and st.

In the word test the great majority of the errors, 73 per cent, involved the ten added characters, and of these errors involving the 10 added characters, more than half were caused by the presence of ch and st in the list. So great was the influence of these two characters ch and st, in causing errors in this test, by involving k with themselves, that we put these errors in a class by themselves, and the errors involving only the letters of the alphabet by themselves, in order to compare them with the alphabet test; and those involving the other 8 signs by themselves. Doing this we find that about 27 per cent of the errors are limited to the alphabet part of this test, and involve only the 26 letters. Thirty-four per cent includes the errors on the 8 other signs plus 18 letters confused with these 8 signs, thus involving 26 characters in all, although only 7 of the letters had many such confusions, namely, t, q, w, x, r, y, and z, the many-dot letters; while about 39 per cent includes only the errors involving ch and st and k letters, thus involving 11 characters in all, although k was the only letter which had many such confusions.

Although in the word test, the open spacing reduced the number of errors on 21 of the letters used as words, yet the mutual confusion between y, n, z, and o, in the word test make an even larger proportion of the errors involving only the 26 letters, than in the alphabet test. The same is true of q and r; and the errors on d, e, f, g, h, i, and j, show the same characteristics that were observed in the alphabet test, namely, that the errors on the right hand corners greatly exceeded those on the left, even with the open spacing. Y was very much benefited by the open spacing, but injured by the increased competition, nearly half of its errors being caused by the addition of for and and to the list. In the analysis of the alphabet test we said that it seemed reasonable to infer that the errors on y, n, z, and o, would be much less

### British Braille

| Errors on each character | | Errors involving each character | |
|---|---|---|---|
| i | 5.07 | l | 16.90 |
| c | 8.45 | a | 20.28 |
| l | 8.45 | i | 21.97 |
| t | 10.14 | c | 23.66 |
| b | 10.14 | g | 23.66 |
| f | 11.83 | s | 25.35 |
| a | 13.52 | b | 27.04 |
| d | 13.52 | m | 27.04 |
| s | 13.52 | e | 32.11 |
| e | 16.90 | f | 33.80 |
| h | 16.90 | p | 33.80 |
| n | 16.90 | the | 33.80 |
| the | 16.90 | v | 35.49 |
| m | 16.90 | d | 37.18 |
| v | 18.59 | th | 52.39 |
| g | 20.28 | wh | 55.77 |
| and | 21.97 | u | 57.46 |
| p | 21.97 | j | 60.84 |
| wh | 23.66 | h | 67.60 |
| th | 23.66 | r | 86.19 |
| r | 25.35 | n | 89.57 |
| u | 40.56 | and | 91.26 |
| ou | 43.94 | x | 91.26 |
| j | 45.63 | t | 96.33 |
| x | 49.01 | o | 99.71 |
| for | 49.01 | w | 108.16 |
| o | 72.67 | ou | 111.54 |
| y | 76.05 | q | 116.61 |
| z | 77.74 | y | 121.68 |
| of | 81.12 | for | 138.58 |
| w | 86.19 | z | 155.48 |
| q | 86.19 | of | 163.93 |
| with | 119.99 | with | 197.73 |
| ch | 160.55 | ch | 446.16 |
| st | 189.28 | k | 518.83 |
| k | 114.05 | st | 534.04 |
| | 1926.60 | | 3853.20 |

if the corners were on the left instead of the right. Now in the word test we have the opposites of two of those letters, namely and and the; and we find that the mutual confusions between them are only 3.3, while those between y and z are 59.15. The total errors on and and the were also much less than the errors on y and z; namely 38.87 on and and the, and 153.79 on y and z. So the testimony that we have is very strongly in favor of the above supposition. The increased competition added many other cases of the same kind of error. Most of the errors on t, q and r were caused by the increased competition with other forms, q being especially confused with for, t with with, and r with of, all of which confusions are on the lower right hand corner.

(k, ch, and st). This brings us to the worst feature of this word test, namely, the mutual confusion between the open characters k, ch, and st, which with a few other confusions with ch and st make 746.9 errors, or about 39 per cent of the total number on the whole test. The difficulty is to tell whether the two dots are in a vertical position as in k (1-3) or slightly slanting as in ch (1-6) and st (3-4). The increased competition of the word test affected k more than any other letter of the British alphabet. The same is true of s in the American Braille test, caused by the addition of only one of these slanting characters (3-4). In fact, taking the whole set of open characters as they are called (1-3, 1-6, 3-4, 1-3-6, 1-3-4, 1-4-6, 3-4-6, 1-3-4-6), namely, those that have upper and lower dots only, without any middle dot, 8 characters in all we have the most difficult competition of any amongst the tall characters. These 8 characters are not confused appreciably with others outside of this set, and when this competition is restricted by the omission of certain ones of these characters, the improvement in the rank of the others is among the most marked of all the changes in the rank of tall characters caused by changes in competition. As only 4 of these cha

acters are in the British alphabet, this competition was very much less in the alphabet test than in the extreme of general reading, where all 8 are used in British Braille. The word test used 6, and was intermediate between the alphabet test and general reading. When the competition was restricted to the 4 characters, *k*, *m*, *u*, and *x*, in the alphabet test, *k* ranked better than either of the other three, but in the word test, the introduction of *ch* and *st* was disastrous to *k*, and caused it to take the poorest rank of all the 36 characters in that test. The rank of *m* would have been very much injured if its opposite, *sh*, had been in the list, as is very evident from the fact that even as it was, *m* was called *sh* 72.67 times, all other errors on *m* being only 16.90. The readers were told that *sh* was not in the list, which must have kept these errors much fewer than they woud have been without this precaution. These errors are not on the number of dots, but on the position. Some readers cannot discern the slight difference between the vertical position of *k*, *m*, and *u*, and the slanting position first encountered by the finger in reading *sh* and *ing* as well as in *ch* and *st*. The same is shown in American Braille, where the finger encounters first the slanting side of p and *n*. Had all these 8 characters been in the test, the results must have been much worse even than they were.

The difficulty of determining the level of single whole-word signs standing alone was not introduced in this test, because it seemed that sufficient evidence in regard to it had been given before. (See 1913 Report, page 13.) (This was also the reason for not including the character 1-4-6 in this test.) There are 6 low-level whole-word signs which are used standing alone in British Braille. The readers were told that the low-level signs were not on the sheets, but notwithstanding this, there were several errors on level. If the low-level signs had been on the sheets, the readers would have been obliged to determine the level every time they came to one of the 12 characters, and there is no doubt that this would have occasioned many more errors.

## Comparison of Word Test With Alphabet Test

### List of Characters and Words Used

| s | b | c | d | f | g | h | i | j | k | l |
|---|---|---|---|---|---|---|---|---|---|---|

| a | but | could | down | from | great | have | I | just | know | like |

| m | n | o | q | r | s | t | u | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|

| my | not | O | quite | right | should | the | under | very | will | you |

| | | | | | | | wh | | th |
|---|---|---|---|---|---|---|---|---|---|

| an | and | for | is | of | on | or | which | would | that |

### Following is a List of the Errors on the American Braille Single-Cell Word Test

| | called | | | | called | | | | called | | | | called | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| s | called | th | 118.66 | for | called | j | 4.00 | t | called | a | 1.34 | and | called | n | 1.33 |
| u | " | n | 54.66 | wh | " | q | 4.00 | h | " | b | 1.34 | d | " | o | 1.33 |
| q | " | for | 40.00 | s | " | u | 4.00 | o | " | b | 1.34 | y | " | o | 1.33 |
| n | " | u | 33.33 | v | " | u | 4.00 | r | " | b | 1.34 | on | " | o | 1.33 |
| w'd | " | is | 30.67 | h | " | v | 4.00 | is | " | c | 1.34 | g | " | q | 1.33 |
| k | " | of | 26.67 | wh | " | v | 4.00 | h | " | d | 1.34 | c | " | s | 1.33 |
| for | " | q | 25.33 | w'd | " | w | 4.00 | w | " | d | 1.33 | a | " | t | 1.33 |
| w'd | " | for | 21.33 | or | " | and | 4.00 | an | " | d | 1.33 | b | " | t | 1.33 |
| w | " | and | 20.00 | q | " | is | 4.00 | b | " | f | 1.33 | o | " | t | 1.34 |
| q | " | k | 18.67 | o | " | of | 4.00 | h | " | f | 1.33 | r | " | t | 1.34 |
| q | " | wh | 18.67 | and | " | of | 4.00 | n | " | f | 1.33 | y | " | t | 1.34 |
| w | " | w'd | 17.33 | o | " | on | 4.00 | t | " | f | 1.33 | th | " | t | 1.34 |
| is | " | w'd | 16.00 | or | " | on | 4.00 | v | " | f | 1.33 | g | " | v | 1.34 |
| v | " | b | 14.67 | w | " | wh | 4.00 | is | " | f | 1.33 | l | " | v | 1.34 |
| k | " | q | 14.67 | q | " | c | 2.67 | h | " | g | 1.33 | for | " | v | 1.34 |
| th | " | s | 13.33 | w | " | c | 2.67 | j | " | g | 1.33 | f | " | w | 1.34 |
| on | " | or | 12.00 | wh | " | f | 2.67 | w'd | " | g | 1.33 | v | " | w | 1.34 |
| on | " | and | 9.33 | q | " | g | 2.67 | c | " | h | 1.33 | wh | " | w | 1.34 |
| g | " | h | 8.00 | o | " | h | 2.67 | f | " | h | 1.33 | i | " | y | 1.33 |
| and | " | w | 8.00 | and | " | i | 2.67 | m | " | h | 1.33 | w | " | y | 1.33 |
| of | " | and | 8.00 | g | " | j | 2.67 | r | " | h | 1.33 | j | " | an | 1.33 |
| q | " | w'd | 8.00 | s | " | j | 2.67 | u | " | h | 1.33 | m | " | an | 1.33 |
| v | " | wh | 8.00 | w | " | k | 2.67 | w | " | h | 1.33 | wh | " | an | 1.33 |
| k | " | c | 6.67 | q | " | n | 2.67 | for | " | h | 1.33 | i | " | and | 1.33 |
| o | " | d | 6.67 | a | " | r | 2.67 | k | " | i | 1.34 | r | " | and | 1.33 |
| v | " | h | 6.67 | y | " | r | 2.67 | m | " | i | 1.34 | th | " | and | 1.33 |
| wh | " | m | 6.67 | j | " | s | 2.67 | n | " | i | 1.34 | g | " | for | 1.33 |
| th | " | n | 6.67 | f | " | t | 2.67 | is | " | i | 1.34 | o | " | for | 1.33 |
| l | " | t | 6.67 | k | " | w | 2.67 | th | " | i | 1.34 | or | " | for | 1.33 |
| o | " | or | 6.67 | b | " | y | 2.67 | f | " | j | 1.34 | c | " | is | 1.33 |
| r | " | a | 5.34 | is | " | y | 2.67 | m | " | j | 1.34 | f | " | is | 1.33 |
| for | " | f | 5.34 | j | " | and | 2.66 | q | " | j | 1.34 | on | " | is | 1.33 |
| is | " | q | 5.33 | j | " | for | 2.66 | y | " | j | 1.34 | f | " | of | 1.33 |
| w'd | " | q | 5.33 | y | " | is | 2.66 | w'd | " | j | 1.34 | w | " | or | 1.33 |
| u | " | s | 5.33 | y | " | of | 2.66 | c | " | k | 1.33 | of | " | or | 1.33 |
| b | " | v | 5.33 | n | " | on | 2.66 | l | " | k | 1.33 | wh | " | or | 1.33 |
| b | " | or | 5.33 | of | " | of | 2.66 | for | " | k | 1.33 | t | " | th | 1.33 |
| f | " | wh | 5.33 | m | " | or | 2.66 | of | " | k | 1.33 | y | " | th | 1.33 |
| k | " | wh | 5.33 | and | " | or | 2.66 | k | " | l | 1.33 | c | " | wh | 1.34 |
| m | " | wh | 5.33 | n | " | th | 2.66 | s | " | m | 1.33 | d | " | wh | 1.33 |
| y | " | b | 4.00 | u | " | th | 2.67 | u | " | m | 1.33 | h | " | wh | 1.33 |
| or | " | b | 4.00 | is | " | th | 2.67 | of | " | m | 1.33 | w'd | " | wh | 1.33 |
| g | " | f | 4.00 | an | " | wh | 2.67 | k | " | n | 1.33 | k | " | w'd | 1.33 |
| k | " | h | 4.00 | for | " | w'd | 2.67 | m | " | ñ | 1.33 | on | " | w'd | 1.33 |
| c | " | i | 4.00 | | " | a | 1.34 | s | " | n | 1.33 | | | | |

This word test differs from the alphabet test in the omission of *c*, *p*, *x*, and *z*, and the addition of 10 characters, *an*, *and*, *for*, *is*, *of*, *on*, *or*, *th*, *wh*, and *would*.

*American Braille*

| Errors on each character | | Errors involving each character | |
|---|---|---|---|
| d | 2.67 | an | 8.00 |
| a | 4.00 | l | 10.67 |
| i | 4.00 | a | 12.00 |
| t | 4.00 | d | 13.33 |
| an | 4.00 | r | 16.00 |
| l | 9.33 | i | 17.33 |
| c | 10.67 | t | 21.33 |
| h | 10.67 | c | 24.00 |
| j | 10.67 | g | 25.33 |
| r | 10.67 | m | 25.33 |
| or | 13.33 | y | 25.33 |
| f | 14.67 | j | 26.67 |
| m | 14.67 | o | 32.00 |
| of | 14.67 | f | 34.67 |
| b | 16.00 | on | 38.67 |
| y | 17.33 | h | 41.33 |
| and | 18.67 | b | 42.67 |
| g | 18.67 | or | 46.67 |
| wh | 21.33 | v | 53.33 |
| th | 24.00 | of | 53.33 |
| on | 25.33 | and | 66.67 |
| o | 28.00 | w | 70.67 |
| is | 30.67 | is | 72.00 |
| v | 36.00 | wh | 76.00 |
| n | 41.33 | k | 92.00 |
| for | 41.33 | u | 106.67 |
| w | 52.00 | for | 109.33 |
| k | 65.33 | n | 110.67 |
| u | 65.33 | w'd | 112.00 |
| w'd | 65.33 | s | 150.67 |
| q | 98.66 | th | 153.33 |
| s | 128.00 | q | 154.66 |
| | 921.33 | | 1842.66 |

This word test was read more rapidly and accurately than the alphabet test, for it took 13 1-3 per cent less time, and there were less than half as many errors, in proportion to the number of characters read. The principal causes must be the open spacing and the omission of *c*, *p*, *x*, and *z*. The effects of both these causes are manifest. The letters which benefited most by the open spacing were *d*, *c*, *g*, *j*, *k*, and *q*. The letters which benefited most by the decreased competition, that is, by the omission of *e*, *p*, *x*, and *z*, were *a*, *m*, *k*, and *q*, respectively.

As *x* and *z* do not stand for words in American Braille, *q* was relieved from confusion with them; but was affected by the increased competition with *for*, *which*, and *would*.

Although in the American Braille word test, the competition was less complete than in the British word test, the errors, so far as they went, followed the same general rules as in the British test.

Taking now the confusions between the five-dot and four-dot characters, we find that *q* and *would* were confused with the four-dot characters in the following ways: *q* with *k*, *would* with *w*, *q* with *is*, *would* with *is*; *q* with *wh*. With these five pairs of corresponding characters, the errors on the right were more than three times as many as on the left. The confusions between *j* and the four-dot characters were very few, for the corresponding characters with which *j* would naturally be confused, namely *ow*, and *ch*, were not in this test, because they do not stand for words.

In the word test *m* (1-3-4) was relieved from competition with *p* (1-4-6) and therefore ranked much better than *u* (1-3-6) which was not relieved from competition with *n* (3-4-6). The number of mutual confusions between *u* and *n* was the largest between any two characters except *s* (1-3) and *th* (3-4). This brings us to the feature in this word test which makes the greatest contrast to the alphabet test, namely, the rank of the letter *s*. In the alphabet test, *s* ranked next to the top, while in the word test, the increased competition, caused by the addition of *th*, pulled *s* down to the very foot of the column.

As *e* does not stand for a word in American Braille, the word test was free from the difficulty of determining the level, and *a* therefore takes a much higher rank than in the alphabet test; but the use of low-level, whole-word signs in American Braille has not been entirely abandoned, and some of the readers had evidently been in the habit of using them; especially low *i* for *in*. The readers were, of course, told that the low-level signs were not on the sheets, yet with some readers, the habit of distinguishing the upper level *i* from the low-level *in*, by its having the capital prefix when standing alone, was so strong that they sometimes mistook the uncapitalized *i* for a low-level *i* or *in*. Such errors show that the low-level whole-word signs are very confusing. (See 1913 Report, page 13.)

## NEW YORK POINT

### Comparison of Word Test With Alphabet Test
### List of Characters and Words Used

| a | b | c | f | g | h | i | j | k | l | o | p |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | but | can | for | great | had | I | just | kind | not | o | part |

| s | u | v | w | y | | | | | wh | ch |
|---|---|---|---|---|---|---|---|---|---|---|
| some | under | very | will | you | and | of | the | that | which | change |

## List of Errors on the New York Point Test on Single Word-Signs Within the Limits of the Third-Base

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v | called | j | 69.00 | y | called | v | 7.50 | w | called | o | 3.00 | and | called | n | 1.50 | | |
| k | " | c | 52.50 | wh | " | v | 7.50 | i | " | s | 3.00 | v | " | o | 1.50 | | |
| y | " | of | 49.50 | w | " | wh | 7.50 | p | " | s | 3.00 | and | " | o | 1.50 | | |
| wh | " | th | 40.50 | wh | " | ch | 7.50 | b | " | v | 3.00 | of | " | o | 1.50 | | |
| n | " | u | 39.00 | w | " | g | 6.00 | o | " | w | 3.00 | wh | " | o | 1.50 | | |
| o | " | the | 39.00 | j | " | g | 6.00 | of | " | and | 3.00 | th | " | p | 1.50 | | |
| a | " | n | 36.00 | and | " | p | 6.00 | j | " | the | 3.00 | ch | " | s | 1.50 | | |
| v | " | th | 36.00 | v. | " | y | 6.00 | and | " | that | 3.00 | the | " | u | 1.50 | | |
| f | " | u | 27.00 | a | " | of | 6.00 | of | " | that | 3.00 | o | " | v | 1.50 | | |
| a | " | f | 27.00 | th | " | of | 6.00 | o | " | a | 1.50 | w | " | v | 1.50 | | |
| ch | " | wh | 25.50 | the | " | th | 6.00 | j | " | b | 1.50 | i | " | w | 1.50 | | |
| u | " | f | 25.50 | c | " | ch | 4.50 | the | " | b | 1.50 | v | " | w | 1.50 | | |
| f | " | a | 22.50 | b | " | i | 4.50 | that | " | b | 1.50 | c | " | y | 1.50 | | |
| of | " | h | 22.50 | g | " | j | 4.50 | and | " | c | 1.50 | i | " | y | 1.50 | | |
| n | " | a | 21.00 | k | " | j | 4.50 | v | " | f | 1.50 | o | " | y | 1.50 | | |
| u | " | n | 21.00 | s | " | p | 4.50 | h | " | g | 1.50 | c | " | and | 1.50 | | |
| h | " | of | 19.50 | c | " | s | 4.50 | k | " | g | 1.50 | i | " | and | 1.50 | | |
| the | " | o | 13.50 | o | " | s | 4.50 | u | " | g | 1.50 | s | " | and | 1.50 | | |
| th | " | wh | 13.50 | th | " | v | 4.50 | th | " | g | 1.50 | th | " | and | 1.50 | | |
| v | " | j | 12.00 | g | " | w | 4.50 | g | " | h | 1.50 | g | " | of | 1.50 | | |
| of | " | y | 12.00 | the | " | of | 4.50 | and | " | i | 1.50 | c | " | the | 1.50 | | |
| o | " | of | 12.00 | j | " | th | 4.50 | u | " | j | 1.50 | c | " | th | 1.50 | | |
| n | " | and | 10.50 | ch | " | th | 4.50 | b | " | k | 1.50 | w | " | th | 1.50 | | |
| ch | " | y | 10.50 | v | " | wh | 4.50 | j | " | k | 1.50 | g | " | wh | 1.50 | | |
| ch | " | of | 10.50 | s | " | c | 3.00 | n | " | k | 1.50 | | | | | | |
| c | " | k | 9.00 | ch | " | j | 3.00 | of | " | k | 1.50 | | | | 915.00 | | |
| p | " | and | 9.00 | o | " | n | 3.00 | f | " | n | 1.50 | | | | | | |

The New York Point word test was read a little more rapidly and considerably more accurately than the alphabet test, for it took 5 per cent less time, and there were only two-thirds as many errors, in proportion to the number of characters read.

### New York Point

| Errors on each character | | Errors involving each character | |
|---|---|---|---|
| i | 7.50 | b | 13.50 |
| b | 9.00 | i | 13.50 |
| s | 9.00 | p | 24.00 |
| p | 12.00 | s | 25.50 |
| g | 13.50 | w | 30.00 |
| and | 15.00 | g | 31.50 |
| w | 19.50 | and | 43.50 |
| h | 21.00 | h | 45.00 |
| c | 24.00 | ch | 67.50 |
| the | 27.00 | the | 70.50 |
| th | 30.00 | k | 73.50 |
| of | 13.50 | c | 81.00 |
| u | 49.50 | o | 88.50 |
| f | 51.00 | y | 90.00 |
| ch | 55.50 | f | 105.00 |
| wh | 57.00 | wh | 109.50 |
| y | 57.00 | j | 111.00 |
| k | 58.50 | a | 114.00 |
| v | 63.00 | u | 117.00 |
| o | 66.00 | th | 130.50 |
| a | 69.00 | n | 135.00 |
| n | 72.00 | of | 153.00 |
| j | 85.50 | v | 157.50 |
| | | | |
| | 915.00 | | 1830.00 |

The competition was much decreased between characters of similar form but different length, which with the open spacing doubtless accounts for the greater accuracy. The 9 letters omitted as they do not stand for words are d, e, l, m, q, r, t, x, z, and the 6 characters added are and, of, the, that, wh, ch.

In the summing up of the analysis of the errors on the New York alphabet, we noted that the principal cause of errors was the difficulty of distinguishing between second and third-base letters, especially between pairs of similar letters in which the third-base has three dots in horizontal succession, as f and o, k and d, g and r, q and l. The omission of both q and l, a pair of letters between which this confusion was very marked in the alphabet test, and the omission of d, m, and r, the second-base letters which were confused with k, b, and g, respectively, greatly reduced that feature in the competition, which in very large measure accounts for the fewer errors in proportion to the number of characters read. None of the 6 characters added have three dots in horizontal succession, although they are all third-base characters, so the increased competition which even in the *number* of characters, only partially offset the decreased competition by the omission of 9 letters, this increase did not bring in the feature which was found to be the most prolific cause of errors in the alphabet test. Still, notwithstanding this greatly reduced competition between second and third-base characters, 25 per cent of the errors were of this kind, while 36 per cent were confusions between four-dot and three-dot characters, all third-base, such as j and v, k and c, of and y, that and v, etc., involving pairs where there is a similarity of shape, and the confusion is in regard to the presence or absence of a certain dot in each case which makes the difference between the two characters of each pair. The next most frequent kind of errors was the mutual confusions between the four-dot characters, such as of, that, wh, ch, and others. These errors made 17 per cent of the total.

As so large a proportion of the New York Point characters were not included in this test, the evidence on the 23 characters used is also proportionally incomplete.

*Third.* We now come to the consideration of the third question at the beginning of this analysis of the word tests, namely, "What further light do these tests shed on the relative legibility of the different characters?"

The British Braille test was the most nearly complete of all the tests, in the range of characters tested; that is, it embodied 82 per cent of the full height and upper level characters, of which there are 44 in all. (That is, there are 63 possibilities within the Braille cell; excluding the 7 front dot characters and the 12 low-level characters leaves 44.)

To ascertain as nearly as possible the relative legibility of these 44 characters, was the purpose of the British and American Braille alphabet and word tests. Of these 44 characters, the British Braille word test tested 36 characters equally in complete competition with each other, which makes it in some important respects the most valuable test we have.

Among the 36 characters used in this test, it appears that two, *ch* and *st*, proved to be such a prolific cause of errors that they are not assigned by the Type Committee to meanings or positions where they would enter into the general competition. As they have been weighed in the balance and found wanting, it is not necessary to include them further in this analysis, which reduces the number of characters for further analysis to 42. There are two of the three-dot characters, *sh* and *ing*, American Braille *p* and *n*, which were not tested in the British alphabet nor word test, but in other tests they have proved so troublesome to many readers that they also are not assigned by the Committee to positions where they will enter into the general competition. This leaves 40 Braille characters whose relative legibility when in complete competition with each other, it is necessary to grade from the results of the tests, and 6 untested characters for which the relative legibility needs to be carefully estimated. These 6 characters are 3 three-dot characters, *ow*, *ar*, and *gh*; 2 four-dot characters, *ed* and *ble*, and one five-dot character, *er*.

In the alphabet tests, the competition was so incomplete, and so different in American Braille from the British Braille for several letters, that the comparison had to be very incomplete, and the question immediately arose as to what rank should be given to the characters which took such different ranks in different competitions. The answer, which was so obscure at that time, has now become clear, and we see that to grade the legibility of the characters, we need to consider the full competition of these 40 characters with each other. If these 40 characters were put into full competition with third-base characters, the results on many of them would be very much changed thereby.

## Special Tendencies in Reading by Touch

Most of the errors illustrate certain special tendencies in reading by the sense of touch. Let us study more definitely just what these tendencies are. After having done this, we can apply the information thus gained to the other 6 characters which were not in the tests, and even still further to some other characters which have never been tested, if this should be desirable.

There are two prominent features in the full set of Braille characters, which are not approved by the Committee, for literary values because they caused so many errors when the characters which illustrate these features were tested for such uses.

(1) Taking all the tests into consideration, when the aid derived from context is removed, distinguishing between the upper and lower levels in Braille gives the most trouble; this means the upper two-thirds of the cell and the lower two-thirds of the cell where the middle dots are common to both upper and lower parts. It does not mean the top dots with the lowest dots, that is, the upper one-third and lowest one-third.

(2) The feature next in order in causing trouble in Braille is the confusion caused by 4 "open" characters, where a slightly slanting position is not easily distinguished from the vertical position. These slanting characters are 1-6 and 1-4-6, 3-4 and 3-4-6, called in British Braille *ch* and *sh*, *st* and *ing*, respectively, and called in American Braille *er* and *p*, *th* and *n*. In regard to 1-4-6 and 3-4-6, the slanting side is the one first encountered by the finger in reading, and some readers do not distinguish this slant from the vertical position of *m* and *u*.

These difficulties in Braille affect the accuracy more than they do the speed, that is, going slowly does not always secure accuracy on these particular features whether to distinguish the level or to distinguish the slant. These features in Braille classified under these two heads can be eliminated from competition in literary assignments and still leave 40 full height and upper level characters.

(3) The next most troublesome feature in the tests was the difficulty in New York Point, of distinguishing between second and third-base, and third and fourth-base. The use of the third-base in connection with Braille characters is a factor to be reckoned with. The difficulties directly or indirectly connected

with the use of the third-base New York Point characters are not so limited in area as either of the difficulties enumerated above in Braille. They affect so large a proportion of the 39 characters of the 2 x 3 area in the horizontal position, that they cannot be eliminated without utilizing the advantage of more characters afforded by the three-level line. The use of the third-base seems to affect the speed as much as if not more than the accuracy. Unlike the difficult features mentioned above which have been embodied in both the British and American Braille, going slowly does help very much in reducing the number of errors caused directly or indirectly by the use of third-base characters. In the New York Point word test there was necessarily a very large proportion of third-base characters, as only 4 second-base letters stand for words, *a*, *n*, *o*, and *s*. So the special opportunities for confusion between the second and third-base were very much reduced from what they were in the alphabet test, and the errors were reduced 45 per cent from those on the alphabet test. The time, however, was only reduced 5 per cent in proportion to the number of characters read, while in the American Braille word test the time was reduced 13 1-3 per cent. Although the third-base characters in the New York Point word test had so little competition, yet they were not read rapidly enough as compared with the other tests to indicate that the third-base lends itself easily to rapid reading, even when the competition is reduced to lowest terms; and when the normal competition is present, the speed and accuracy are both reduced. If placed in complete competition with the Braille characters as part-words, the same result might follow.

Now aside from these three special difficulties, level, slant and third-base, what are the remaining special tendencies?

As another aid in clearly tracing out the remaining special tendencies alluded to, we have a tabular analysis* of all the mutual confusions between pairs of characters, for every error involves two characters.

## Description of the Tabular Analysis

In the tabular analysis the mutual confusions are arranged in a set of columns: Column 1 gives all the mutual confusions between the 6-dot and 5-dot characters; column 2 gives all the mutual confusions between the 5-dot characters only; column 3 between the 5-dot and 4-dot characters; column 4 between the 4-dot characters only, and so on through a complete set of columns, including all the errors. It will be noticed that columns 1, 3, 5, 7, 9, give the confusions between characters which differ by one dot, while columns 2, 4, 6, 8, give the confusions between characters which have the same number of dots, and that all columns above 9 give the confusions between characters differing by more than one dot. These tables of tabular analysis show much more clearly than the simple lists of errors, what the special tendencies are in regard to errors in touch reading.

## Errors Between Characters Differing by One Dot

Having sufficiently considered the errors involving low-level and slanting characters in Braille, we subtract them, in order to study the remainder.

After this subtraction of the errors involving *ch* and *st* in the British Braille list, and those involving *c*, *n*, *p* and *th* in the American Braille list, we have left in the Braille alphabet and word lists combined, 4,396.06 errors, of which 2,818.94 are classified together as between pairs of corresponding characters which differ from each other by one dot; and 887.81 errors are classified together as between corresponding characters having the same number of dots; and the remaining errors are of such various kinds, that among them all there are not enough of any one kind to indicate any special tendency.

The 2818.94 errors show two corresponding complementary tendencies, that of missing a dot in the larger one of two corresponding characters, and calling it the other, and *vice versa*, adding the same dot to the smaller character and calling it the larger. Out of the 2818.94 errors of this kind, the omissions of the dots on which the errors were made in the larger characters were 1604.08 and the additions of the same dots in the smaller characters were 1214.83, a ratio of about 4 to 3 in favor of the smaller characters.

(4) So we see from this that next after the three most troublesome difficulties which were enumerated at the beginning of this section, the tendency to miss a dot in the larger one of two corresponding characters is the most pronounced, and

(5) That to add the same dot to the smaller one of the two characters is the next. Both these complementary tendencies are very much more frequent among the many-dot characters, and on the right side,

* As these tables are too large to be included in the Report, a description of them is given, in order that allusions to them may be understood.

and on some dots more than on others, as both depend very much in some cases on the number of the dots, and in other cases on the position of the dots and of the characters. An illustration of errors dependent not on the number of dots at all, but on the position, is with British *y* and *and*. These two characters have the same number of dots and the same shape, the only difference being in the position, and it is the difference in position that caused the difference in the number of errors. Dots were missed in *y* nearly five times as often as in *and*.

In this reckoning we have made no differentiation as to which dots were missed and added. But there is a great difference in the dots in this respect, and the information which can be gleaned as to this feature is valuable in determining assignments of characters.

### Classification as to Dots on which Errors were Made

For a classification of errors according to the dots on which the errors were made, we take the errors between characters which differ by one dot; and we take them from the British Braille word test, because it includes a larger range of characters than either of the other tests. For this reason it not only sheds more light on the relative legibility of the characters tested than the other tests do, but also indirectly on the 6 untested characters; and it is important to trace out what indirect evidence we can in regard to these 6 characters, and in regard to the effect that their omission had upon some of the characters in the test, by relieving them of a portion of the natural competition which they would encounter in the use of the whole set of 10 characters. This is done through well-founded analogies and reasonable inferences, and by estimating for the 6 characters, numbers of errors, or averages of numbers, which we find set against the most similar characters.

Taking the tabular analysis of the British Braille word test described on page 57, which gives the mutual confusions between pairs of characters arranged in columns, we can tell exactly in which columns the 6 missing characters would appear if they had been in the test. For instance Column 1 gives the confusions between *for* and each of the five-dot characters that stand for words. Only one of the five-dot characters, *er*, was omitted. As all of the five-dot characters which were in the test appear in Column 1, it is most reasonable to infer that the other one would also, if it had been in the test. The only question is in regard to the number of errors which would have been made on it if it had been in the test. The omitted five-dot character, *er*, is similar in shape to *with*, *of*, and *q*. The confusions between *for* and these three characters, is in regard to the presence or absence of the corner dots, No. 1 for *with*, No. 4 for *of*, and No. 6 for *q*; the number of such confusions being 15.21, 30.42, and 64.22, respectively. This illustrates the tendency or rule that in regard to these three corners, the lower right hand corner, No. 6 dot, is the most liable to error, and the upper left, No. 1 dot, the least liable to error, and No. 4 dot intermediate between them. The difference between *for* and *er* is in the presence or absence of the lower *left* corner, No. 3 dot. The average number of errors on the lower left corner is much less than on the lower right corner, so the confusions between *for* and *er* would in all probability be much less than between *for* and *q*, or in this case, much less than 64.22. In the same way we learn that the tendency to error on the lower left corner of a character is considerably greater than on the *upper* left corner, so the confusions between *for* and *er* would in all probability be considerably more than between *for* and *with*; that is, in this case, considerably more than 15.21. The average of all the errors in Column 1, that is, between the six-dot and five-dot characters, is 27.38, which fulfills the conditions given above. This also produces some effect upon *for*, and serves to round out the full information on *for* when in complete competition with all six of the five-dot characters as it must be in the system as a whole. In the same way, the information contained in each column sheds light on the missing character or characters which would have appeared in those special columns if they had been in the test, and on the effect which the missing characters would have had on corresponding characters which were in the test. For most of the pairs where there is a question, there is another pair in which the conditions were so similar that the same number may be taken for the answer to the question. In other cases, an average of two or more numbers which come nearest to having similar conditions, is taken, for it is evident from the "actual tactual" errors on the British word test that the character for *the* (2-3-4-6) is better than its opposite, *z*, (1-3-5-6); and that the character for *and*, (1-2-3-4-6), is better than its opposite, *y*, (1-3-4-5-6), and therefore we can but infer that the character for *ed*, (1-2-4-6), is better than its opposite, *n*, (1-3-4-5), especially as its corner comes on dot 1, which causes the least trouble of any corner. The tests also show that *p*, (1-2-3-4), is better than its opposite *th*, (1-4-5-6), and we can but infer that *v*, (1-2-3-6), is better than its opposite *ble*, (3-4-5-6), for the same reason.

With the full information in the tabular analysis of the mutual confusions between pairs of corresponding characters differing by one dot in the British word test, we have estimated similar mutual confusions involving the 6 untested characters, supposing they had entered into this one test. Of course, the

estimates or questions in *this* test are fewer than they would be for any other test, and the proportion of the actual information greater. We thus have 1090.39* errors, 92 different errors, involving all the 40 characters, to classify according to the dots on which the errors were made. The table for this has a separate column for each of the 6 dots, and the errors are entered in the columns according to the dot involved. The resulting averages on the four corners are: Dot 1, 2.30 errors; dot 3, 9.39 errors; dot 4, 12.04 errors; and dot 6, 17.90 errors. We see that the difference or gradation between the numbers for the four corners, is greatest between dots 1 and 3, namely, 7.09; while the difference between dots 3 and 4 is the smallest, only 2.65; and between dots 4 and 6, the difference is greater again, namely, 5.86.

*Average Errors on Corner Dots*

Dot 1    2.30
"   3    9.39
"   4    12.04
"   6    17.90

Much also depends upon how much a dot is exposed by space around it. The errors on dot 6 were the most frequent amongst these 1090.39 confusions, but most of these were made on such characters as *y*, *z*, etc., where dot 6 has adjacent dots on two sides, whereas comparatively few were made on dot 6 in such characters as *and*, *the*, etc., where the dot is exposed on three sides. The number of errors on the positions with two adjacent dots made 83.1 per cent of the 1090.39 errors, while those on the exposed positions made only about 16.8 per cent, and this great contrast in the number of errors was notwithstanding the fact that the 40 characters have more dots in the exposed positions than in the positions with two adjacent dots; for there are 146 dots in the 40 characters, of which 89 are in the exposed positions, and 57 have two adjacent dots.

All these considerations have a bearing on the additional evidence afforded by this test on relative legibility, and on the selection of characters for assignments.

There are 20 characters which have corner dots with 2 adjacent dots, namely, *for*, *g*, *and*, and *y*, and the four groups of four characters each; the *q* group comprising *q*, *er*, *with* and *of*; the *n* group comprising *n*, *z*, *ed*, and *the*; the *p* group comprising *p*, *v*, *th*, and *ble*; and the *d* group comprising *d*, *f*, *h*, and *j*. There is also one group of four characters without corners, the *s* group comprising *s*, *gh*, *wh*, and *ar*.

Comparing the characters in the 5 groups of four characters each, with each other in regard to the errors which illustrate the two complementary tendencies considered in this section, gives the following proportional average gradations:

| The "d" Group | | The "s" Group | | The "p" Group | | The "n" Group | | The "q" Group | |
|---|---|---|---|---|---|---|---|---|---|
| h | 1.23 | s | 2.96 | p | 3.38 | the | 4.85 | er | 12.33 |
| f | 2.32 | gh | 4.44 | v | 6.76 | ed | 6.43 | q | 15.07 |
| j | 3.39 | wh | 7.61 | th | 8.04 | n | 7.47 | of | 16.20 |
| d | 4.83 | ar | 9.30 | ble | 10.41 | z | 15.78 | with | 22.78 |

In the *p* group, *th* and *ble*, having the corner on the right are confused with *wh*, and *ar*, respectively, in the *s* group; while *p* and *v*, having the corner on the left have fewer errors of this kind, especially *p*, which has the corner on dot 1, and has very few errors, making *p* the best one of the group. Conversely this is also the reason why *wh* and *ar* in the *s* group are poorer than *s* and *gh*. The *p* group and the *s* group are especially related to each other, character for character; *p* with *s*, *v* with *gh*, *th* with *wh*, and *ble* with *ar*. The *s* group differs from the other four groups in having all the dots "exposed," so that the errors in this group are not generally the missing of a dot, but confusion with the corresponding characters of the *p* group. The reason why *er* is the best one of the *q* group, is because the most difficult dot No. 6, is an exposed dot in that character, while in *of* and *with*, it is a corner dot with two adjacent dots, and causes more trouble with them in confusions with the smaller characters, *ou* and *t*; and *q* being without dot 6 is the one of the four, which has the most confusions with *for*. So *er* has the advantage in both kinds of confusions, those with the characters having one dot less on the one hand, and, on the other hand with the character having one dot more. *With* has the fewest confusions with *for* because that involves the easiest or surest dot, dot 1, but has the most confusion with *t* because that involves dot 6, the dot which is the least sure of accuracy. *Q* has the most confusion with *for*, because that confusion is on dot 6, while it has the least with *t* because that is on dot 1. *Of* has a medium number of confusions with *for* because it involves dot 4, and also a medium number of confusions with *ou*, because it involves dot 3. So it seems that the two characters that have the thick square part at the top have somewhat the advantage over the pair that has the thick square part at the bottom.

Taking the four groups of *two* tall characters each, which are the exact opposites of each other, we have in this connection the following:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ow | 4.37 | r | 9.46 | and | 9.30 | t | 10.99 |
| o | 13.65 | w | 10.31 | y | 12.68 | ou | 14.70 |

* *Note.*—This number is made up of 865.28 actual errors made on the 34 characters in the test, plus 225.11 errors estimated separately for the 6 untested characters, each placed in its own column, according to the plan of the table.

With the first pair, *ow* and *o*, *ow* has the advantage, not because it is so much better than *o* when they are considered independently of other characters; but in reading, the characters cannot be considered independently of the others, and *o* is influenced by poorer mates than *ow* is; and this makes a great difference. The corresponding mates of *o* are *n* and *z*, which are poorer characters than the corresponding mates of *ow*, which are *ed* and *the*; so that *n* and *z* cause more confusions with *o*, than *ed* and *the* cause with *ow*.

Considering the last pair, *t* and *ou*, we find that the cause for *t* having the advantage over *ou* is that their confusions with the corresponding larger characters, *q* and *with*, *er* and *of*, respectively, are more frequent than with the corresponding smaller characters of the *s* group. So far as the missing of dots 2 and 5, in confusion with the *s* group is concerned, the chances are equal for the two characters, but the confusion of *t* with *q* and *with*, involves dots 6 and 1, respectively, and dot 1 does not count for much on errors; but in the confusion of *ou* with *er* and *of*, dots 3 and 4 are involved, both of which combined, rather more than balance dot 6, although either one alone would cause less confusion than dot 6.

The character for *for* (1-2-3-4-5-6) has four corners, and every dot in it has two adjacent dots, and we have seen that these features increase the liability to miss dots; but this character has some advantages over the five-dot characters (see page 34), and the number of errors *on for* is considerably less than the average for the five-dot characters. The only kind of an error that can be made on *for* is that of confusion with smaller characters, while the five-dot characters have the two kinds of errors, confusions with the larger character and confusions with the smaller characters, which are considered in this section, besides confusions with the characters having the same number of dots, from which *for* is also free. There is only one five-dot character, *and*, that had fewer errors than *for*. The number of errors *involving for* (page 43) is almost exactly the same as the average number involving the five-dot characters. Where there are so many dots to a character as 5 and 6, the readers are as liable to miss noticing the one vacant space in five-dot characters, as to miss one dot in the six-dot character.

The character *g* (1-2-4-5) also has the disadvantage of having four corners with two adjacent dots for each one, and so presents more opportunities for missing a corner dot than the other characters except *for*, but it has the advantage of being the only one of its kind, instead of being one of a group of similar characters. *G* is seldom confused with the characters having one more dot, but its errors are mostly of the one kind, confusion with the four triangles.

## Errors Between Characters Having the Same Number of Dots

(6) Although the tendency to errors between corresponding characters differing by one dot is the most pronounced after the difficulties of level, slant and third-base, yet the tendency to errors between similar characters having the same number of dots is also very appreciable, and comes next in order. In the four Braille tests combined, these errors amount to 887.81 (and appear in columns 2, 4, 6, 8, of the tabular analysis, described on page 40), although the pairs of such similar characters were not fully nor equally represented in the tests. Had they been, the number would have been greater, but it is large enough to show the characteristic tendency. Of these, the reversings of exact opposites right and left were 613.07, the rest being caused by special similarities within the groups of four characters each, other than reversings. Among the 40 characters there are 15 pairs of exact opposites, so the reversings are confined to 30 characters, while the whole 40 are involved in the errors between characters differing by one dot.

The 10 odd characters which do not have exact opposites, have that much in their favor, as they are entirely free from the influence of this tendency to error.

(7) The five groups of four similar characters each also have an additional disadvantage as compared with the groups of only two each in this particular, because the mutual confusions within the groups, include not only the reversings, but the other similarities of shape, which also occasion some characteristic errors, such as between *n* and *z* in the British alphabet test, and *q* and *x* in the American test, etc. Errors of this kind make up the 274.74 errors included with the 613.07 in the 887.81 errors between similar characters having the same number of dots.

We have now enumerated 7 causes of errors, or special tendencies to error in reading embossed dot characters by touch. These conclusions have been drawn from a study of nearly 9,000 errors, classified and analyzed in regard to their proportional relations to each other.

With the adoption of the variable-base, there are available 343 third-base characters, of which 25 New York Point third-base characters are utilized in the systems presented, as whole-word signs, because they were already in use, familiar to a large part of the readers, and their relative value estimated in the results of the Committee's work. (See Appendix B.) The full height or three-level third-base characters have not been tested, or their relative values estimated, but the foregoing pages might shed some light upon the probable relative values of these characters.

# PART III. BRITISH BRAILLE TWO-CELL WORD SIGNS

## List of Two-Cell Contractions Used

| c | c | d | e | f | g | h | h | j |
|---|---|---|---|---|---|---|---|---|
| Christ | cannot | day | ever | father | God | here | had | Jesus |

| m | m | n | o | p | r | s | s | t |
|---|---|---|---|---|---|---|---|---|
| mother | many | name | one | part | right | some | spirit | time |

| d | u | u | w | w | w | y | the | the |
|---|---|---|---|---|---|---|---|---|
| under | upon | unto | work | word | world | young | there | these |

| the | th | th | wh | wh | ou | ch |
|---|---|---|---|---|---|---|
| their | through | those | where | whose | ought | character |

## Errors on British Braille Two-Cell Word Signs

| *Errors on Each Word* | | | | *Errors involving Each Word* | |
|---|---|---|---|---|---|
| | had | 15.6 | | had | 31.2 |
| | cannot | 35.1 | | God | 66.3 |
| m. | there | 35.1 | | Christ | 74.1 |
| m. | Christ | 39.0 | | cannot | 89.7 |
| | God | 39.0 | | Jesus | 89.7 |
| | Jesus | 46.8 | | world | 89.7 |
| m. | world | 50.7 | | their | 97.5 |
| | ever | 54.6 | | through | 128.7 |
| m. | part | 54.6 | | here | 140.4 |
| m. | work | 54.6 | | word | 144.3 |
| m. | through | 54.6 | | part | 148.2 |
| m. | here | 58.5 | | under | 148.2 |
| m. | their | 66.3 | | spirit | 159.9 |
| ch. | character | 70.2 | | work | 163.8 |
| m. | day | 74.1 | | character | 171.6 |
| m. | word | 78.0 | | father | 175.5 |
| ch. | one | 78.0 | | day | 195.0 |
| | father | 89.7 | | young | 195.0 |
| | young | 89.7 | | upon | 198.9 |
| m. | where | 93.6 | | many | 210.6 |
| m, | under | 97.5 | | one | 241.8 |
| m. | upon | 101.4 | | where | 257.4 |
| m. | some | 109.2 | | some | 269.1 |
| m. | spirit | 109.2 | | there | 280.8 |
| m. | unto | 109.2 | | those | 280.8 |
| p. | mother | 117.0 | | ought | 280.8 |
| | whose | 124.8 | | unto | 284.7 |
| m. | many | 128.7 | | whose | 288.6 |
| m. | ought | 144.3 | | these | 315.9 |
| ch. | those | 159.9 | | mother | 315.9 |
| ch. | name | 202.8 | | ever | 378.3 |
| m. | right | 214.5 | | name | 421.2 |
| p. | time | 214.5 | | right | 425.1 |
| m. | these | 222.3 | | time | 522.6 |

This test was added after the return of the Construction Agent from England (see page 6), and was taken in order to compare two-cell contractions with third-base New York Point characters. Eighteen third-base word-signs had been used in the New York Point word test (see page 37), and that was the only third-base test with which to compare the British two-cell word test. There was such a contrast in the conditions of these two tests that direct comparison did not prove to be very practicable, although

some very important evidence on several points was gleaned from the two-cell test. In these two tests competition between corresponding similar forms was at a minimum in the New York Point test and at a maximum in the British two-cell test, or approximately so. The words *am*, *an* and *at* were used on the two-cell sheets with the single-cell and two-cell whole-word signs. These three words were introduced in order to ascertain if the single-dot prefix in the words *mother*, *name* and *time* would be confused with the letter *a* in these words. As a result there were 397* errors between the single-dot prefix and the letter *a*. The two-dot prefix was called *b* 27 times and there were 54 other confusions between prefixes and letters or parts of letters, making 479 errors involving prefixes.

Only five of the British two-cell word-signs and New York Point third-base word-signs correspond at all with each other in shape, that is, in the number and position of the dots; namely, *Jesus* with *great*, *God* with *had*, *ever* with *you*, *day* with *of*, and *Christ* with *the*.

There are three distinct kinds of errors on the two-cell sheets; namely, the ordinary mistake on the shape of a character, that is, the number and position of the dots in the character such as we have been analyzing in all the other tests; second, the position of a character as a whole, as between *a* and the single-dot prefix, which is an error on level and space; and third, a mistake in the *meaning* of a letter or character which has two, three, or four meanings, as determined by the kind of prefix or lack of prefix. About 56 per cent of all the errors on these sheets were of this last kind. Twenty out of the 34 two-cell words had the great majority of their errors on the meanings. These are marked "m" in the table (page 44). Four words had the majority of their errors on the character itself; these four, are marked "ch" in the table. With the words *mother* and *time*, marked "p" in the table, the majority of the errors involved the prefix only, that is, calling it *a*. The words *name*, *some*, and *those*, also had occasionally the same kind of error, namely, involving the prefix only, but other errors were more frequent on these three words. The eight words which are not marked, had their errors nearly equally divided between two kinds of errors, that is, errors on the meanings, and errors on the characters themselves. Errors on the meanings might be supposed to indicate ignorance as to the meanings, but the trouble was in having so many meanings for the same characters, depending too largely upon suggestiveness. The plan, attractive in theory, seems to be carried too far, and some confusion results. For instance, the letter *w* has four whole-word meanings depending upon the kind of prefix or lack of prefix. *U* and *the* also have four, *th* and *wh* three, and so on. Reading them all correctly without aid from the context requires greater skill than the majority of readers have at command.

*The errors are proportioned to the same number of readings for each word as in the other tests.

# APPENDIX B

## Part-Word and Whole-Word Time Values and Accuracy Values for Punctographic Characters

*Note.*—Two values have been estimated for some characters which may appear under different conditions. For example, the character 1–2–4–5 has a higher value if the structure of the system is such that it is not likely to be confused with the character 2–5–6; and the character 1–4 is better when opportunity for confusion with 1–4–7 is removed.

| CHARACTERS | TIME VALUES | | ACCURACY VALUES | | CHARACTERS | TIME VALUES | | ACCURACY VALUES | |
|---|---|---|---|---|---|---|---|---|---|
| | Part Word | Whole Word | Part Word | Whole Word | | Part Word | Whole Word | Part Word | Whole Word |
| | 92.38 preferred | 107.53 | 97.77 preferred | 99.12 | | 152.30 | 126.44 | 97.12 | 98.00 |
| | 133.03 second | | 94.76 second | | | 213.68 | 154.94 | 76.28 | 91.84 |
| | 117.09 preferred | 105.37 preferred | 97.76 preferred | 98.84 preferred | | 179.31 | 107.47 | 91.80 | 99.24 |
| | 108.61 second | 151.73 second | 91.71 second | 97.27 second | | 157.58 | 123.45 | 94.08 | 95.28 |
| | 120.70 preferred | 115.44 | 97.76 preferred | 98.03 preferred | | 137.47 | 110.80 | 80.36 | 94.12 |
| | 173.81 second | | 94.74 second | | | | | 92.00 third | 97.13 third |
| | 143.30 preferred | 113.91 preferred | 96.49 preferred | 98.60 preferred | | 179.31 | 118.05 | 90.56 | 98.24 |
| | 205.35 second | 164.03 second | 89.40 second | 98.71 second | | 178.96 | 114.94 | 91.88 | 97.48 |
| | 100.20 preferred | 109.00 second | 96.09 preferred | 98.32 preferred | | 117.96 | 130.34 | 92.08 | 98.76 |
| | 144.29 second | | 90.81 second | 96.05 second | | 179.31 | 130.00 | 80.84 | 95.84 |
| | 143.30 preferred | 116.81 preferred | 94.92 preferred | 98.10 preferred | | 157.59 | 118.97 | 97.84 | 97.79 |
| | 208.35 second | 168.25 second | 88.06 second | 95.54 second | | 179.31 | 119.20 | 92.84 | 91.16 |
| | 141.78 | 115.02 preferred | 95.14 | 98.64 preferred | | 171.03 | 123.15 | 91.20 | |
| | | 166.92 second | | 96.80 second | | 148.39 | 120.56 | 93.56 | |
| | 143.30 | 115.75 preferred | 95.47 | 96.94 preferred | | 171.03 | 111.94 | 97.21 | 91.96 |
| | | 166.68 second | | 92.81 second | | 178.96 | 117.91 | 92.96 | 97.48 |
| | 107.01 preferred | 119.93 preferred | 96.87 preferred | 97.61 preferred | | 160.08 | 126.44 | 89.16 | 98.00 |
| | 154.09 second | 172.56 second | 92.94 second | 94.33 second | | 147.30 | 126.32 | 89.53 | 98.30 |
| | 143.30 | 125.46 preferred | 95.56 | 97.62 preferred | | 168.50 | 128.39 | 95.90 | 94.84 |
| | 122.21 | 181.11 second | 96.32 | 94.41 second | | 116.76 | 127.70 | 91.04 | 93.72 |
| | | 147.07 second | | 98.72 preferred | | 214.68 | 149.43 | 97.88 | 91.26 |
| | 116.26 | 109.37 | 97.28 | 81.08 second | | 161.84 | 134.25 | 82.86 | 97.90 |
| | 144.48 preferred | 117.70 preferred | 96.78 preferred | 99.24 | | 138.16 | 135.40 | 96.56 | 96.88 |
| | 161.72 second | 124.25 second | 92.22 second | 83.72 preferred | | 134.26 | 128.16 | 77.65 | 80.60 |
| | 161.83 | 109.08 | 89.40 | 77.65 second | | 189.98 | 153.79 | 72.92 | 74.76 |
| | 119.89 | 124.94 | 89.80 | 91.96 | | 161.88 | 146.32 | 89.80 | 96.28 |
| | 118.40 | 130.29 | 96.86 | 95.68 | | 161.84 | 116.07 | 88.38 | 97.40 |
| | 213.70 | 160.46 | 82.86 | 96.60 | | 146.88 | 118.20 | 96.44 | 97.56 |
| | 171.44 | 137.83 | 87.54 | 92.38 | | 158.85 | 128.02 | | 91.40 |
| | 124.02 | 111.61 | 86.32 | 95.00 | | 157.59 | 107.93 | 95.14 | 96.04 |
| | 116.78 | 114.66 | 97.86 | 98.60 | | 138.83 | 112.41 | 89.26 | 92.68 |
| | 144.48 preferred | 134.98 preferred | 96.44 preferred | 95.21 | | 162.39 | 131.49 | 90.40 | 93.84 |
| | 161.72 second | 160.92 second | 89.24 second | 97.82 preferred | | 163.96 | 132.76 | 92.67 | 96.20 |
| | 147.30 | 128.89 | 95.96 | 95.32 second | | 151.74 | 122.86 | 95.12 | 98.71 |
| | 171.44 | 128.65 | 94.76 | 97.56 | | | 126.41 | | 93.00 |
| | 162.30 | 145.98 | 92.26 | 94.96 | | 178.96 | 114.91 | 92.10 | 95.61 |
| | 168.51 | 122.99 | 91.04 | 94.76 | | 178.96 | 114.94 | 92.10 | 95.61 |
| | 161.84 | 141.49 | 87.36 | 95.82 | | 146.08 | 117.26 | 92.94 | 97.56 |
| | 152.30 | 113.68 | 96.80 | 91.24 | | 148.39 | 120.20 | 97.24 | 100.00 |
| | 178.96 | 118.85 | 86.76 | 97.60 | | 160.97 | 130.34 | 92.08 | 93.76 |
| | 178.96 | 144.97 | 89.80 | 93.80 | | | | | |
| | 148.68 | 131.02 | 84.52 | 93.21 | | | | | |
| | | | | 90.76 | | | | | |
| Average | | | | | | 153.01 | 123.89 | 92.56 | 96.08 |

# APPENDIX C

## RECURRENCE OF COMMON ENGLISH WORDS

*Note.*—The following alphabetical list of about 7,645 different words, with their indicated repetitions, making a total of 48,203 words, contained in eight pages of newspaper matter, is based upon a count of the 44,105 common English words contained therein, made by Mr. R. C. Eldridge, of Niagara Falls, N.Y., to which have been added the proper names which were omitted in the original tabulation. The matter so counted was as follows: *The Buffalo Sunday News* of August 8, 1909, pages 4 and 6; *The Buffalo Sunday Express* of July 11, 1909, pages 13 and 27; *The Buffalo Sunday Courier* of July 18, 1909, pages 33 and 45; and *The Buffalo Sunday Times* of August 1, 1909, pages 37 and 53.

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1002 | acquaintance | 2 | advantages | 2 | aids | 1 | Alonzo | 1 | annually | 2 |
| abandoned | 2 | acquaintances | 1 | advantageous | 1 | ailments | 1 | Alphonse | 3 | annuity | 1 |
| abandoning | 1 | acquisition | 1 | adventure | 1 | aim | 2 | already | 13 | Annunciation | 1 |
| abandons | 1 | acre | 1 | advertise | 2 | aimed | 3 | also | 32 | anointing | 1 |
| Abdue | 1 | acres | 3 | advertising | 2 | aims | 1 | altered | 1 | anointment | 1 |
| ability | 4 | across | 3 | advisable | 1 | air | 12 | although | 12 | another | 27 |
| able | 7 | act | 9 | advise | 2 | airship | 6 | altitude | 1 | Anselm | 1 |
| ablest | 1 | acting | 3 | adviser | 1 | airtight | 2 | altitudes | 1 | answer | 7 |
| aboard | 7 | acts | 5 | advises | 2 | airy | 1 | altogether | 2 | answered | 2 |
| abolished | 2 | action | 26 | advising | 1 | Aix | 1 | always | 12 | answers | 1 |
| abolition | 1 | actions | 1 | advocate | 1 | Alabama | 2 | am | 9 | antecedents | 1 |
| about | 71 | active | 4 | advocates | 3 | alarm | 2 | amassed | 1 | ante-equinoctial | 1 |
| above | 7 | activities | 2 | Aero | 1 | alarms | 1 | amateur | 1 | ante-mortem | 1 |
| above-named | 1 | activity | 1 | aeronaut | 2 | Alaska | 1 | ambition | 1 | anther | 5 |
| Abraham | 1 | actress | 1 | aeroplane | 3 | Alaskan | 1 | ambitions | 2 | anthers | 3 |
| abreast | 1 | actual | 5 | affair | 3 | Albany | 3 | ambitious | 1 | Anthony | 2 |
| abroad | 4 | actually | 1 | affairs | 9 | Albert | 15 | ambulance | 3 | anticipate | 1 |
| abrupt | 1 | acute | 2 | affect | 4 | alcoholic | 2 | ambulances | 1 | anticipated | 1 |
| absence | 5 | Adam | 3 | affecting | 1 | Ald | 1 | ambuscade | 2 | anticipates | 2 |
| absent | 3 | Adams | 1 | affection | 1 | aldermanic | 1 | amendment | 16 | anticipating | 1 |
| absolute | 2 | added | 3 | affects | 1 | aldermen | 1 | amendments | 11 | antiquarians | 1 |
| absolutely | 3 | adding | 1 | affidavits | 1 | Aldis | 1 | amends | 1 | antique | 1 |
| absurdity | 1 | Addington | 2 | affinity | 1 | Aldrich | 3 | among | 29 | antiquities | 1 |
| abundant | 1 | addition | 8 | affirms | 1 | Aldrich-Payne | 1 | amount | 13 | antiquity | 1 |
| abundantly | 2 | additional | 2 | affirmative | 2 | alert | 1 | amounting | 3 | Antionette | 1 |
| abuse | 1 | address | 2 | afflicted | 1 | Alexandra | 1 | amounts | 2 | anxious | 2 |
| abutting | 2 | addressed | 1 | afford | 3 | Alexandria | 1 | ample | 1 | any | 87 |
| academy | 1 | addresses | 1 | afloat | 1 | Alexander | 5 | amuse | 1 | anybody | 2 |
| accent | 1 | adds | 2 | aforesaid | 1 | Alfonso | 1 | amusing | 2 | anyhow | 1 |
| accept | 1 | adequate | 1 | afraid | 1 | Alfred | 4 | amusements | 1 | anyone | 3 |
| acceptance | 1 | adherents | 1 | Africa | 1 | Algernon | 1 | an | 175 | anything | 15 |
| accepted | 4 | Adirondacks | 1 | aft | 1 | Ali | 3 | Ann | 1 | anyway | 1 |
| accident | 9 | adjacent | 1 | after | 93 | alias | 2 | Anne | 1 | anywhere | 1 |
| accidental | 1 | adjourn | 1 | afternoon | 33 | alighted | 1 | and | 1371 | apartment | 1 |
| accidentally | 2 | adjourned | 2 | afterward | 5 | alighting | 1 | anarchist | 1 | apartments | 1 |
| accidents | 2 | adjournment | 3 | afterwards | 1 | alike | 1 | ancestors | 1 | aphorism | 1 |
| accommodate | 1 | adjudged | 1 | again | 13 | alimony | 3 | ancient | 3 | apologize | 1 |
| accommodations | 3 | adjust | 1 | against | 35 | Aline | 1 | anecdotes | 1 | apostolic | 1 |
| accompanied | 2 | adjustment | 3 | age | 4 | alive | 1 | Angeles | 3 | appalling | 1 |
| accompanying | 1 | administered | 1 | aged | 11 | all | 146 | anger | 2 | apparatus | 3 |
| accomplice | 1 | administering | 2 | agency | 1 | Allegany | 1 | angered | 1 | apparent | 2 |
| accomplish | 2 | administration | 2 | agents | 2 | allegation | 1 | Anglican | 1 | apparently | 4 |
| accord | 3 | administrative | 2 | ages | 2 | alleged | 11 | Anglo-American | 1 | appeal | 4 |
| accordance | 1 | Admiral | 1 | aggregate | 2 | alleges | 2 | Anglo-Prussian | 1 | appeals | 1 |
| accorded | 3 | admired | 1 | aggressive | 1 | Allen | 2 | angry | 1 | appear | 8 |
| according | 15 | admirer | 1 | agitation | 3 | alley | 3 | animal | 1 | appearance | 3 |
| accost | 1 | admissions | 1 | ago | 34 | alliance | 1 | animals | 2 | appeared | 9 |
| account | 7 | admit | 2 | agony | 1 | allied | 1 | animosities | 1 | appears | 3 |
| accountants | 1 | admits | 3 | agree | 2 | allow | 1 | animosity | 1 | Appellate | 1 |
| accounting | 1 | admitted | 1 | agreed | 6 | allowable | 1 | Anna | 1 | appetite | 1 |
| accounts | 1 | admitting | 1 | agreement | 5 | allowance | 1 | Annapolis | 1 | apple | 1 |
| accuracy | 1 | adopt | 1 | agreements | 1 | allowed | 5 | Annette | 1 | apples | 3 |
| accused | 4 | adopted | 9 | agrees | 1 | almost | 20 | annex | 2 | applicable | 1 |
| accustomed | 2 | adoption | 1 | agricultural | 1 | almshouse | 1 | announced | 4 | application | 8 |
| achieved | 1 | Adriatic | 1 | ah | 1 | Almy | 1 | announces | 2 | applied | 3 |
| achievement | 4 | advance | 1 | ahead | 3 | aloe | 1 | announcing | 2 | apply | 1 |
| acknowledged | 1 | advanced | 3 | Ahearn | 1 | alone | 10 | announcement | 4 | appointed | 8 |
| acknowledging | 1 | advancement | 1 | aid | 5 | along | 14 | announcements | 1 | appointment | 5 |
| Acme | 1 | advantage | 2 | aide-de-camp | 3 | alongside | 1 | annual | 12 | | |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Word | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| appointments | 1 | artistic | 2 | attitude | 3 | badly | 4 | Bay | 6 | Bergers | 1 |
| apportionment | 1 | as | 298 | attorney | 5 | bag | 3 | be | 406 | Bergman | 1 |
| appraisal | 1 | ascertained | 1 | attorney's | 2 | baggage | 1 | beach | 2 | Berkshire | 1 |
| appreciable | 1 | ashes | 1 | attract | 1 | bagging | 1 | Beach | 17 | Berlin | 5 |
| appreciation | 1 | Asheville | 1 | attorneys | 1 | Ball | 1 | Beaconsfield | 1 | Bernhard | 2 |
| apprehended | 1 | ashore | 1 | attracted | 1 | ball | 21 | Beatrice | 2 | berth | 1 |
| approached | 2 | Ashtabula | 1 | attractions | 5 | bail | 3 | been | 219 | beside | 2 |
| approaching | 2 | aside | 1 | attractive | 1 | bailed | 1 | beaded | 1 | besides | 1 |
| appropriate | 2 | ask | 5 | attractively | 1 | Bailey | 4 | beam | 1 | Best | 1 |
| appropriated | 1 | asked | 19 | attribute | 2 | Balfour | 1 | beans | 1 | best | 21 |
| appropriating | 2 | asking | 2 | attributed | 1 | ballast | 1 | bear | 3 | bestow | 1 |
| appropriately | 1 | asks | 2 | Aube | 1 | Balliett | 2 | bearer | 1 | bestowed | 1 |
| appropriation | 4 | asleep | 3 | Aubert | 1 | Balliett's | 3 | bearers | 1 | Bethman-Hollweg | 1 |
| approval | 2 | aspects | 1 | auctions | 1 | balloons | 1 | bearing | 3 | better | 9 |
| approved | 1 | asphalt | 1 | audacity | 1 | balls | 4 | beat | 3 | betrayals | 1 |
| approves | 2 | asphyxiation | 1 | August | 4 | Baltimore | 1 | beaten | 4 | between | 27 |
| approving | 1 | aspirants | 2 | Augustine | 1 | bamboo | 1 | Beaulieu | 1 | Betz | 2 |
| approximation | 1 | aspirations | 4 | Augustus | 1 | ban | 1 | beauties | 1 | Beulah | 1 |
| April | 2 | aspires | 1 | aunt | 2 | banana | 1 | beautiful | 7 | Beveridge | 1 |
| aqualine | 1 | Asquith | 1 | Aurelia | 1 | bananas | 1 | beautifully | 1 | beyond | 5 |
| Arabs | 8 | assassin | 1 | Aurora | 1 | band | 10 | beauty | 3 | bible | 3 |
| Archbishop | 1 | assassination | 4 | auspices | 1 | bands | 3 | Beck | 3 | bicycle | 1 |
| Arch | 1 | assault | 1 | austere | 1 | bank | 5 | became | 8 | bid | 3 |
| arch | 1 | assemble | 1 | authentic | 1 | band-wagon | 1 | because | 26 | bidder | 3 |
| archeology | 1 | assembled | 1 | authenticated | 1 | bandits | 2 | become | 13 | bidding | 2 |
| Archie | 3 | assembly | 3 | author | 3 | banished | 1 | becomes | 2 | big | 28 |
| architectural | 1 | asserted | 1 | authoritative | 1 | Bank | 1 | becoming | 2 | bigamy | 2 |
| architecture | 2 | asserts | 1 | authority | 3 | banker | 2 | bed | 2 | bigger | 3 |
| arctic | 2 | assessed | 1 | authorities | 7 | bankrupt | 1 | bedside | 1 | biggest | 2 |
| arduous | 1 | assessor | 1 | authorized | 3 | bankruptcy | 6 | Beecher | 1 | bill | 29 |
| are | 214 | assets | 1 | authorizes | 1 | banner | 1 | befall | 1 | Billy | 1 |
| area | 2 | assign | 1 | Austin | 1 | banquet | 1 | before | 52 | billets | 1 |
| argue | 1 | assigned | 1 | Austria | 1 | Baptiste | 1 | beg | 3 | bills | 1 |
| argued | 1 | assignment | 2 | Austrian | 1 | Barbara | 2 | began | 6 | Bingham | 7 |
| Arguelles | 1 | assist | 4 | auto | 5 | Barbary | 1 | begin | 13 | Binghamton | 3 |
| Arguelles's | 1 | assistance | 5 | automobile | 15 | Bar | 1 | beginning | 9 | birds | 1 |
| argus-eyed | 1 | assisted | 1 | automobiles | 1 | barber | 1 | begins | 4 | birth | 3 |
| argument | 7 | associated | 13 | autopsy | 1 | barber's | 1 | begun | 5 | bishop | 1 |
| Argyle | 1 | association | 2 | autos | 1 | Barcelona | 4 | behalf | 5 | bit | 2 |
| arise | 1 | associations | 1 | autumn | 1 | bard | 1 | behavior | 2 | bite | 1 |
| arisen | 1 | assume | 1 | auxiliary | 1 | bare | 1 | beheaded | 2 | bitten | 3 |
| arises | 1 | assumed | 1 | available | 2 | barely | 1 | behind | 8 | bitter | 3 |
| Arizona | 1 | assuming | 1 | availibility | 1 | Barentzen | 1 | being | 51 | bituminous | 1 |
| arm | 5 | assurance | 2 | avalanche | 1 | bargain | 1 | beings | 1 | Black | 1 |
| Armand | 1 | assure | 1 | avalanches | 2 | barking | 2 | belated | 2 | black | 1 |
| armed | 1 | assured | 3 | avenged | 1 | Barnes | 1 | belief | 4 | Blackhall | 1 |
| armies | 1 | astonished | 2 | avenue | 6 | baron | 2 | believe | 7 | Blade | 1 |
| armored | 1 | Astor | 1 | average | 2 | baroness | 2 | believed | 15 | Blairsville | 1 |
| armory | 1 | at | 391 | averred | 1 | barrel | 2 | believer | 1 | blame | 1 |
| arms | 1 | ate | 3 | avers | 1 | barrels | 3 | believers | 1 | Blanc | 1 |
| army | 8 | athletic | 6 | avoid | 4 | barrettes | 1 | believes | 6 | blank | 1 |
| arose | 1 | atmospheres | 1 | avoided | 1 | barrister | 1 | believing | 3 | Bleriot | 2 |
| around | 8 | atmospheric | 1 | awakened | 1 | bats | 1 | bell | 1 | Bleriot's | 1 |
| aroused | 3 | attached | 2 | await | 2 | Barth | 1 | Bell | 4 | Blexinger | 1 |
| arrange | 1 | attaches | 2 | awaited | 2 | Bartholemy | 1 | belonged | 1 | blew | 3 |
| arranged | 2 | attack | 3 | awaits | 3 | Bartley | 2 | belonging | 3 | blind | 3 |
| arrangement | 2 | attacks | 2 | award | 1 | Barton | 1 | belongings | 3 | blindness | 1 |
| arrangements | 10 | attain | 1 | awarded | 2 | base | 3 | belongs | 1 | Bliss | 1 |
| arranges | 1 | attained | 3 | away | 21 | baseball | 3 | below | 3 | block | 5 |
| array | 1 | attempt | 8 | awes | 1 | based | 1 | Bemer | 1 | Block | 2 |
| arrayed | 1 | attempted | 7 | awful | 2 | basement | 3 | Ben | 1 | blocks | 3 |
| arrest | 11 | attempting | 2 | axis | 1 | basket | 1 | bench | 3 | blood-lust | 1 |
| arrested | 14 | attempts | 1 | | | basis | 2 | bend | 2 | bloody | 1 |
| arrival | 2 | attend | 22 | | | Bass | 2 | Bender | 3 | blooms | 1 |
| arrive | 1 | attendance | 2 | Babcock | 1 | bastinadoed | 1 | bending | 1 | Bloomington | 1 |
| arrived | 5 | attendants | 2 | babes | 1 | Batavia | 4 | beneath | 2 | Bloss | 1 |
| arriving | 3 | attended | 2 | babies | 1 | Bates | 1 | benediction | 1 | blossom | 2 |
| art | 1 | attendings | 2 | baby | 11 | bath-house | 1 | benefit | 1 | blossomed | 1 |
| Arthur | 1 | attends | 1 | Bachman | 1 | baths | 1 | benefits | 1 | Blot | 2 |
| article | 5 | attention | 10 | back | 22 | battle | 3 | Benjamin | 2 | blow | 5 |
| articles | 4 | attic | 1 | backing | 1 | battles | 1 | bent | 2 | blowing | 3 |
| artificial | 1 | attire | 1 | background | 1 | Bavaria | 1 | benzine | 1 | blue | 8 |
| artist | 1 | attired | 1 | bad | 7 | bay | 1 | berate | 1 | Blue | 2 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| bluff | 1 | breakfast | 2 | Bulgaria | 2 | Canadian | 4 | caucuses | 1 | charter | 3 |
| Board | 1 | breaking | 3 | Bulgarian | 1 | Canal | 1 | caught | 5 | chasing | 1 |
| board | 16 | Breckley | 1 | bulk | 2 | canal | 4 | cause | 15 | chatelaine | 1 |
| boarder | 1 | Breckenridge | 1 | bullet | 1 | cancer | 4 | caused | 8 | chatted | 1 |
| boards | 2 | breeding | 1 | bump | 1 | candidacy | 2 | causes | 5 | chattel | 1 |
| boast | 1 | breeze | 2 | bumped | 1 | candidate | 15 | causing | 1 | chauffeur | 12 |
| boasts | 1 | breezy | 1 | bumping | 1 | candidates | 12 | caustic | 1 | chauffeurs | 1 |
| boat | 7 | Bremen | 3 | bumps | 1 | candor | 1 | Cavalry | 1 | chauffeur's | 1 |
| boats | 3 | Brennan | 1 | bunch | 1 | canine | 3 | cavalry | 4 | Chautauqua | 1 |
| Bob | 1 | Brentwood | 1 | burden | 1 | Cannat | 1 | cavalryman | 1 | cheaper | 3 |
| body | 27 | Brewster | 1 | burdens | 2 | Cannon | 1 | cease | 2 | check | 8 |
| bodies | 2 | brick | 1 | Burdette | 4 | cannot | 9 | ceases | 1 | checks | 2 |
| bodily | 1 | bridge | 8 | Bureau | 1 | Canterbury | 1 | Cefeuil | 1 | cheered | 1 |
| Bog | 1 | brief | 3 | bureau | 2 | Canton | 4 | celebrate | 2 | cheerless | 1 |
| Bolleyn | 1 | brigadier | 1 | bureaus | 5 | canvassing | 1 | celebrated | 3 | chef | 2 |
| Bolmarie | 1 | brigands | 1 | burglars | 1 | Canyon | 2 | celebration | 18 | chemical | 1 |
| Bolton | 1 | bright | 1 | burglaries | 2 | capacity | 5 | celestial | 1 | Cherbourg | 4 |
| bomb | 1 | Brighton | 3 | burglary | 2 | Cape | 1 | Cement | 2 | Cherry | 2 |
| bond | 2 | brilliant | 2 | buried | 1 | capital | 5 | cemetery | 1 | Chicago | 27 |
| Bone | 1 | bring | 13 | Burke | 2 | Captain | 3 | censuring | 1 | Chicagoans | 1 |
| bone | 1 | bringing | 3 | Burley | 3 | captain | 1 | census | 1 | Chicago's | 2 |
| Bonfires | 1 | brings | 1 | Burlington | 2 | capture | 4 | cent | 6 | Chihuahua | 1 |
| Bonser | 1 | brisk | 1 | burned | 7 | captured | 3 | center | 3 | Chief | 4 |
| book | 7 | Bristow | 1 | burning | 2 | car | 44 | centered | 1 | chief | 12 |
| booklets | 1 | Britain | 5 | burnished | 4 | card | 2 | centers | 4 | chiefly | 2 |
| books | 2 | Britain's | 2 | Burns' | 1 | cards | 4 | central | 3 | child | 11 |
| boom | 1 | British | 13 | Burrows | 2 | Cardinal | 1 | cents | 4 | children | 17 |
| booms | 1 | Britt | 1 | Burt | 2 | care | 11 | centuries | 3 | child's | 1 |
| boost | 1 | broached | 1 | Burznski | 1 | cared | 2 | centurion | 1 | children's | 2 |
| boosted | 1 | broad | 1 | bus | 3 | career | 7 | century | 9 | China | 3 |
| Bordeaux | 1 | Broadway | 3 | Busbee | 1 | careers | 1 | ceremonies | 2 | Chinaman | 4 |
| border | 1 | Broderick | 1 | bushes | 6 | carefully | 2 | certain | 9 | Chinese | 6 |
| Bores | 1 | Broezel | 2 | bushels | 3 | careless | 1 | certainly | 5 | Chisolm | 5 |
| boring | 2 | Brogan | 1 | business | 25 | cares | 1 | certificate | 1 | Choate | 1 |
| born | 8 | broke | 3 | busy | 2 | caretaker | 1 | chains | 1 | choice | 2 |
| Borne | 1 | broken | 17 | but | 135 | caretakers | 1 | chair | 5 | Chojnachi | 1 |
| borrowed | 1 | brokers | 2 | Butter | 2 | Carew | 1 | chairman | 3 | cholera | 3 |
| Borzilleri | 1 | bronze | 1 | Buttiar | 1 | cargo | 6 | Chairman | 2 | Chong | 3 |
| boss | 1 | brooches | 1 | buy | 5 | carload | 3 | chairmanship | 1 | choosing | 1 |
| bosses | 1 | brook | 1 | buying | 2 | Carlton | 1 | chairmen | 2 | chopped | 1 |
| both | 26 | Brooklyn | 5 | Bwano | 1 | Carnegie | 1 | challenged | 1 | chosen | 1 |
| Botsford | 1 | Brooks | 1 | by | 409 | carnival | 1 | chamber | 2 | Christian | 1 |
| bottle | 1 | Brother | 1 | bye | 1 | carriage | 1 | challis | 1 | Christie | 2 |
| bottom | 5 | brother | 5 | | | carried | 9 | chamberlain | 1 | Christie's | 1 |
| bought | 9 | Brotherhood | 1 | | | carries | 3 | Chamberlain | 1 | Christiano | 1 |
| boulevard | 1 | brothers | 3 | cabbages | 1 | Carroll | 1 | Chamonix | 1 | chronic | 1 |
| bound | 4 | brother-in-law | 2 | cabinet | 6 | carry | 11 | Champ | 1 | Chrystal | 55 |
| bounds | 1 | brought | 21 | Cable | 1 | carrying | 4 | champions | 2 | chunk | 1 |
| Bourbon | 1 | Broussard | 1 | cable | 9 | cars | 17 | Champlain | 1 | church | 9 |
| Bourbon-Orleans | 1 | brown | 2 | cablegram | 1 | Carthagenian | 1 | chance | 3 | Church | 16 |
| Bouska | 1 | Brown | 3 | Cairo | 2 | cartridges | 1 | chances | 2 | churches | 3 |
| Bowery | 2 | Bruso | 1 | Cairns | 1 | carved | 1 | Chancellor | 1 | cigars | 1 |
| bowling | 1 | brutal | 1 | cajolery | 1 | cast | 6 | chancellor | 1 | Cincinnati | 2 |
| bows | 1 | brutality | 1 | Calabacullia | 1 | cascades | 1 | chancellorship | 3 | cinders | 1 |
| Box | 1 | brute | 1 | Calif | 1 | case | 31 | chancery | 1 | circled | 1 |
| box | 3 | bruised | 3 | California | 1 | cased | 1 | change | 8 | circles | 2 |
| boxes | 2 | bruises | 4 | call | 9 | cases | 12 | changed | 2 | Circuit | 1 |
| boy | 9 | Bryn | 1 | Callahan | 1 | cash | 2 | changes | 3 | circular | 1 |
| boys | 16 | Bubach | 2 | called | 21 | cashed | 2 | changing | 2 | circulars | 6 |
| bracelet | 1 | Buchanan | 1 | calling | 2 | cast | 6 | Chapel | 1 | circulated | 2 |
| Bradford | 1 | Buck | 2 | calls | 1 | castle | 2 | chapter | 1 | circulation | 1 |
| Bradley | 1 | Buck's | 1 | calm | 3 | casual | 1 | character | 2 | circumstance | 1 |
| brag | 1 | Buckingham | 2 | calmer | 1 | casually | 1 | characteristic | 2 | circus | 2 |
| brain | 1 | Buckley | 1 | Calvin | 2 | Cat | 1 | characteristics | 2 | cite | 1 |
| Brainard | 2 | budget | 2 | came | 32 | Catalonia | 1 | characterizes | 1 | citizen | 3 |
| brake | 1 | Buelow's | 1 | camp | 6 | cataract | 1 | charge | 24 | citizens | 2 |
| branch | 1 | Buffalo | 46 | campaign | 10 | catastrophe | 2 | charged | 6 | citizenship | 1 |
| branches | 2 | Buffalonians | 1 | Campbell | 1 | catch | 1 | charges | 6 | cities | 9 |
| brass | 2 | build | 5 | Camboya | 1 | Cathedral | 1 | charging | 3 | city | 93 |
| brave | 1 | builder | 1 | camping | 2 | Catherine | 2 | charity | 3 | city's | 1 |
| bravest | 1 | building | 22 | campus | 1 | Catholic | 1 | Charles | 43 | civil | 2 |
| bread | 1 | buildings | 10 | can | 50 | cats | 1 | charm | 1 | civilized | 1 |
| break | 1 | built | 9 | Canada | 2 | caucus | 1 | charming | 1 | claim | 4 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| claimed | 9 | collection | 1 | compass | 1 | confusion | 1 | contest | 6 | corroborated | 1 |
| claiming | 2 | college | 1 | compel | 1 | congested | 2 | contestant | 1 | Cory | 1 |
| claims | 8 | collided | 1 | compelled | 2 | congestion | 2 | contested | 2 | cost | 15 |
| claptrap | 1 | collieres | 1 | compensation | 2 | congerie | 1 | contesting | 1 | costly | 2 |
| Clarence | 2 | Collins | 1 | competent | 2 | congratulated | 1 | contests | 1 | costumes | 1 |
| Clark | 4 | collision | 1 | competition | 2 | congratulating | 1 | continent | 2 | cots | 1 |
| class | 7 | Colonel | 3 | competitive | 2 | congratulations | 4 | continental | 1 | cottages | 1 |
| classes | 1 | colonel | 1 | competitors | 4 | congratulatory | 2 | continual | 1 | cotton | 5 |
| classic | 1 | colonel's | 1 | complainant | 1 | congregation | 2 | continually | 2 | couch | 1 |
| Clay | 1 | colonies | 6 | complaining | 2 | congress | 4 | continue | 3 | could | 35 |
| clean | 5 | colonnades | 1 | complaint | 6 | Congress | 1 | continued | 4 | Council | 3 |
| cleaners | 1 | color | 2 | complaints | 3 | congressional | 2 | continues | 2 | Councilman | 1 |
| cleaning | 1 | colorless | 1 | complete | 18 | Congressman | 1 | continuing | 1 | council | 12 |
| clear | 3 | colors | 1 | completed | 12 | Conly | 2 | continuous | 1 | counsel | 2 |
| cleared | 1 | Coltz | 1 | completely | 5 | connected | 2 | contraband | 1 | counsels | 2 |
| clearing | 1 | Columbia | 1 | completing | 1 | Connecticut | 2 | contract | 13 | Count | 1 |
| clearly | 2 | Columbian | 1 | completion | 1 | connecting | 1 | contracted | 1 | Countess | 1 |
| Clen | 1 | Columbus | 1 | complexion | 1 | connection | 8 | contracts | 3 | counter | 1 |
| Clericals | 1 | column | 2 | complexity | 1 | connections | 1 | contractors | 2 | counterthreat | 1 |
| clerk | 7 | columns | 1 | compliance | 1 | conquer | 1 | contrary | 3 | counting | 1 |
| clerk's | 1 | Colwell | 1 | complicated | 1 | conqueror | 1 | contrast | 2 | countless | 1 |
| clerks | 12 | combination | 6 | complications | 1 | conquerors | 1 | contribute | 1 | countries | 4 |
| clergy | 1 | combine | 3 | complicity | 1 | conquests | 1 | contributed | 2 | countrymen | 4 |
| clever | 3 | combined | 2 | complied | 1 | consciousness | 1 | contributes | 3 | country | 28 |
| Cleveland | 22 | combines | 1 | complimentary | 1 | conscript | 1 | contribution | 2 | county | 5 |
| client | 1 | combs | 1 | comply | 2 | consecration | 1 | contributors | 1 | couple | 5 |
| clients | 1 | combustion | 1 | composed | 1 | consequence | 4 | control | 6 | courage | 3 |
| Clifford | 2 | come | 19 | composing | 1 | consequences | 1 | controversy | 2 | Courier | 7 |
| Clifton | 1 | comes | 4 | compromise | 1 | consent | 4 | contusions | 2 | Courier-Journal | 2 |
| climate | 3 | comfort | 6 | compromises | 3 | consented | 1 | convened | 1 | Courtland | 3 |
| climax | 1 | comfortable | 1 | Comptroller | 2 | Conservatoire | 3 | convenience | 1 | course | 17 |
| climb | 1 | comfortably | 1 | conceded | 1 | consider | 4 | convening | 1 | court | 46 |
| climber | 1 | Comica | 1 | conceived | 1 | considerable | 7 | convention | 14 | courted | 1 |
| climbing | 2 | coming | 12 | concentrate | 1 | considerably | 1 | conventions | 3 | courtier | 1 |
| Clinton | 3 | command | 3 | concern | 1 | considerate | 1 | conversion | 1 | court's | 1 |
| clipped | 1 | commanders | 1 | concerned | 6 | consideration | 6 | convert | 1 | courts | 11 |
| clipping | 4 | Commanders | 1 | concerning | 4 | considerations | 1 | converts | 1 | courtyard | 1 |
| close | 10 | Commandery | 1 | concert | 5 | considered | 9 | converted | 2 | cousin | 1 |
| closed | 8 | commanding | 3 | concluded | 2 | considering | 2 | conveyed | 2 | cover | 3 |
| closes | 1 | commands | 3 | conclusion | 2 | consist | 1 | convicted | 5 | covered | 7 |
| closely | 2 | commence | 1 | conclusive | 3 | consisted | 2 | conviction | 1 | covering | 1 |
| closing | 2 | commenced | 1 | conclusively | 2 | consisting | 1 | convicts | 3 | covers | 2 |
| clothe | 1 | commencing | 1 | concrete | 2 | consists | 2 | convocation | 1 | Cowes | 1 |
| clothes | 2 | commend | 1 | concussion | 1 | conspicuous | 4 | convoy | 1 | craft | 2 |
| clothing | 6 | commendation | 1 | condemnation | 1 | conspiracy | 1 | Cooke | 1 | craftsmen | 1 |
| cloud-burst | 1 | commended | 2 | condemned | 2 | constable | 1 | cool | 3 | Crane | 1 |
| Clover | 2 | commends | 1 | condensed | 1 | constant | 2 | Coons | 1 | crank | 1 |
| club | 28 | comment | 1 | condition | 14 | constantly | 2 | cooperation | 2 | crashed | 1 |
| Club | 4 | commerce | 9 | conditions | 6 | Constantinople | 3 | copies | 1 | cravat | 1 |
| clue | 1 | commercial | 2 | conduct | 3 | consternation | 1 | copper | 12 | create | 2 |
| coal | 1 | commission | 6 | conducted | 1 | constituency | 1 | copy | 2 | created | 2 |
| coaling | 4 | commissioners | 6 | conducting | 1 | constitute | 1 | Cora | 2 | creation | 1 |
| coarse | 1 | commit | 3 | conductor | 1 | constituted | 1 | Corcoran | 7 | credence | 2 |
| coast | 5 | committed | 6 | conducts | 1 | constitutes | 1 | cordially | 1 | credit | 1 |
| coatroom | 1 | committee | 33 | Coney | 1 | constitution | 1 | core | 1 | credited | 1 |
| Coburg | 2 | committeeman | 1 | Confederate | 4 | constructed | 3 | co-religionist | 1 | creditor | 4 |
| code | 1 | committeemen | 1 | Confederacy | 2 | construction | 5 | corn | 1 | creditors | 1 |
| co-ed | 1 | committees | 5 | confer | 2 | consul | 1 | Cornelius | 2 | credulous | 1 |
| Coeur | 1 | commodity | 1 | conferees | 1 | consult | 1 | corner | 5 | creek | 3 |
| coffee | 2 | common | 9 | conference | 18 | consultation | 1 | corners | 1 | creeks | 1 |
| Coffey | 1 | Common | 3 | conferred | 2 | consumed | 2 | coroner | 1 | Cretan | 2 |
| coffin | 2 | Commons | 2 | confessed | 5 | consumption | 1 | coronation | 5 | crew | 4 |
| cognomens | 1 | commonwealth | 1 | confession | 5 | contain | 2 | Cornwall | 1 | cried | 3 |
| coin | 1 | commonwealths | 1 | Confessions | 1 | contained | 1 | corporation | 12 | cries | 1 |
| coincident | 1 | communities | 1 | confidence | 2 | containing | 3 | corps | 3 | crime | 6 |
| cold | 2 | community | 2 | confident | 3 | contains | 3 | Corps | 1 | crimes | 1 |
| Colfax | 5 | companions | 3 | confidently | 1 | contemporaries | 2 | corpse | 2 | criminal | 3 |
| Colgan | 1 | company | 15 | confine | 1 | contempt | 2 | correct | 1 | crippled | 1 |
| collapsed | 1 | Company | 12 | confined | 3 | contend | 1 | correcting | 1 | critical | 1 |
| collar | 1 | company's | 2 | confirmation | 1 | contented | 1 | correctional | 1 | crisis | 2 |
| colleagues | 1 | comparative | 1 | confirms | 1 | contends | 1 | correspond | 1 | criticism | 2 |
| collect | 1 | compared | 4 | conflagrations | 1 | contention | 1 | correspondent | 4 | criticisms | 1 |
| collected | 6 | comparison | 1 | conflict | 1 | contents | 1 | correspondents | 1 | critics | 1 |
| | | | | | | | | corridors | 1 | | |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cromwell | 1 | Danil | 1 | deed | 2 | departure | 1 | Dhindra | 1 | dispatched | 1 |
| crops | 1 | Danner | 7 | deemed | 1 | depend | 1 | diameter | 1 | display | 2 |
| cross | 1 | Danner's | 2 | deep | 7 | depends | 1 | diamond | 10 | displayed | 2 |
| Crosse | 1 | Danser | 4 | Deepdene | 1 | Depew | 1 | Diamond | 1 | displaying | 1 |
| crossed | 2 | dapper | 1 | deepening | 1 | depicts | 1 | diamonds | 6 | displeased | 1 |
| crossing | 3 | dared | 1 | deeply | 2 | deportation | 1 | Dickenson | 1 | disposal | 2 |
| crowd | 9 | daring | 1 | deer | 1 | deportment | 1 | dictionary | 1 | dispose | 2 |
| crowded | 1 | daredevil | 1 | defamation | 1 | deposed | 2 | did | 43 | disposed | 2 |
| crowding | 1 | dash | 6 | default | 1 | deposited | 1 | Diebold | 1 | disposes | 1 |
| crowds | 2 | dashed | 3 | defaulted | 1 | depot | 2 | died | 18 | disposing | 1 |
| crown | 4 | date | 3 | defeat | 1 | deprived | 2 | Diego | 1 | disposition | 1 |
| Crown | 1 | dated | 1 | defeated | 3 | depth | 1 | Diehl | 1 | disproved | 1 |
| Crownprince | 3 | dates | 7 | defendants | 2 | deputy | 4 | dies | 2 | dispute | 2 |
| Crownprincess | 3 | dating | 1 | defense | 3 | Deputy | 4 | difference | 9 | disputed | 2 |
| crowning | 1 | daughter | 9 | defends | 1 | Der | 1 | differences | 2 | Disraeli | 1 |
| cruel | 1 | Davenport | 1 | defensive | 1 | derailed | 1 | different | 5 | disregarding | 1 |
| cruelties | 1 | David | 6 | defer | 1 | dereliction | 1 | differently | 1 | dissatisfied | 2 |
| cruelty | 1 | Davis | 1 | deferred | 2 | derived | 1 | difficult | 2 | dissension | 1 |
| cruise | 2 | dawn | 1 | defiance | 1 | Des | 3 | difficulties | 3 | dissenting | 1 |
| cruiser | 2 | day | 47 | deficiency | 1 | Desbeck | 1 | difficulty | 7 | distance | 6 |
| cruisers | 1 | daylight | 1 | defied | 1 | descend | 1 | dignity | 2 | distances | 1 |
| crunching | 1 | day's | 1 | Defoss | 1 | descended | 1 | dilapidated | 1 | distant | 2 |
| crushed | 3 | days | 26 | defraud | 1 | descending | 1 | dilates | 1 | distinct | 1 |
| cry | 1 | Dayton | 3 | defray | 1 | descends | 1 | dim | 1 | distinguished | 6 |
| cube-like | 1 | dazed | 1 | Degnan | 2 | describe | 2 | Dingley | 1 | distinguishes | 1 |
| cubic | 6 | De | 2 | degree | 10 | described | 1 | dinner | 4 | distressed | 1 |
| Cuddeback | 1 | dead | 14 | degrees | 2 | describes | 2 | diocese | 1 | distributed | 2 |
| cultivated | 1 | deadly | 2 | Delaunary | 2 | description | 2 | diplomatic | 1 | distribution | 1 |
| cultivation | 1 | deafening | 1 | delay | 5 | desert | 2 | direct | 22 | District | 1 |
| cup | 4 | deal | 10 | delayed | 3 | Desert | 1 | directed | 1 | district | 8 |
| cure | 5 | dealer | 1 | delegate | 1 | deserted | 3 | directing | 1 | districts | 1 |
| curiosities | 1 | dealers | 4 | delegates | 8 | deserts | 1 | directly | 2 | disturbance | 2 |
| curiosity | 1 | dealing | 3 | delegations | 1 | deserved | 1 | direction | 5 | disturbing | 1 |
| curious | 1 | deals | 1 | Delevan | 1 | deserves | 1 | director | 11 | ditch | 1 |
| curiously | 1 | Dean | 1 | Delaware | 2 | deserving | 1 | directors | 4 | diver | 1 |
| current | 4 | Dean's | 1 | Delia | 1 | design | 3 | dirigible | 2 | divided | 2 |
| currents | 2 | death | 13 | deliberately | 2 | designated | 1 | disappeared | 4 | dividing | 1 |
| curry | 1 | deaths | 1 | deliberation | 1 | desirable | 1 | disappointed | 2 | divined | 1 |
| curtain | 1 | debarred | 1 | delicate | 1 | desire | 1 | disappointment | 1 | diving | 2 |
| curve | 1 | debate | 9 | delightful | 3 | desires | 1 | disarm | 1 | Division | 3 |
| curved | 1 | debated | 1 | delights | 1 | desirous | 2 | disaster | 2 | division | 5 |
| Curzon | 3 | debating | 1 | deliver | 1 | despatched | 1 | Disbroe | 1 | divorce | 12 |
| cushions | 1 | debauch | 2 | delivered | 4 | despatches | 1 | discharge | 1 | divorced | 3 |
| custodians | 1 | debris | 2 | delivering | 1 | despite | 7 | disclaimed | 1 | divorcee | 1 |
| custody | 3 | debt | 3 | delivery | 1 | despondency | 1 | discouraged | 2 | divorces | 7 |
| customary | 2 | decade | 1 | Dell | 1 | destined | 2 | discourses | 1 | Dixie | 1 |
| customers | 5 | decay | 1 | De Luxe | 1 | destiny | 1 | discover | 1 | do | 55 |
| customs | 3 | decency | 1 | demand | 3 | destroy | 3 | discovered | 4 | dock | 1 |
| cut | 11 | decentralization | 2 | demanded | 3 | destroyed | 6 | discoveries | 1 | docks | 1 |
| Cuthbertson | 2 | decide | 3 | demands | 3 | destroyers | 1 | discovers | 1 | Dockstader | 1 |
| cuts | 2 | decided | 14 | Democracy | 1 | destruction | 2 | discovery | 5 | doctor | 4 |
| Cuyler | 5 | decidedly | 1 | Demagogue | 1 | destructive | 2 | discredit | 1 | doctors | 3 |
| cylinder | 10 | decides | 1 | Democrat | 3 | detachment | 1 | discuss | 3 | doctrine | 2 |
| Cyrus | 1 | deciding | 1 | Democrats | 8 | detail | 2 | discussed | 2 | doctrines | 1 |
| Czar | 2 | decision | 8 | Democratic | 13 | detailed | 3 | discusses | 1 | documents | 3 |
| | | decisive | 1 | demonstrate | 1 | details | 3 | discussing | 1 | does | 22 |
| daily | 6 | deck | 1 | demonstrates | 1 | detain | 1 | discussion | 8 | dog | 3 |
| D'Alene | 2 | deckle | 1 | demonstration | 3 | detained | 2 | diseased | 2 | dogmas | 1 |
| Dallas | 1 | decks | 2 | demonstrations | 1 | detectives | 2 | disestablish | 1 | dogs | 2 |
| damage | 1 | declamation | 1 | demoralized | 1 | detention | 1 | disfranchised | 1 | Doherty | 4 |
| dame | 1 | declaration | 4 | denied | 4 | determination | 1 | disgrace | 1 | doing | 6 |
| Dame | 1 | declare | 3 | denies | 2 | determined | 6 | disguised | 1 | Dolores | 1 |
| Damiza | 1 | declared | 2 | Denmark | 2 | dethroned | 2 | disgust | 1 | dollars | 2 |
| dams | 1 | declares | 3 | Denny | 1 | Detroit | 7 | dishonesty | 1 | Domedion | 1 |
| Dana | 1 | declaring | 2 | denounces | 1 | devastation | 1 | disinherited | 1 | domestic | 3 |
| Danbury | 1 | decline | 1 | denouncing | 1 | developed | 1 | disintegrate | 1 | dominant | 1 |
| dances | 1 | declined | 2 | dense | 1 | development | 1 | disintegration | 1 | Dominion | 1 |
| dancing | 1 | declines | 2 | dental | 1 | device | 3 | dislocated | 1 | done | 19 |
| danger | 2 | decorations | 1 | denunciation | 1 | devote | 1 | dismayed | 1 | Donovan | 3 |
| dangerous | 3 | decrease | 1 | deny | 1 | devoted | 6 | dismissed | 3 | doomed | 1 |
| dangerously | 1 | decreased | 1 | departed | 1 | devotes | 1 | disobey | 1 | door | 5 |
| dangling | 1 | decree | 1 | department | 11 | devoting | 1 | Dispatch | 1 | doors | 5 |
| Daniel | 13 | dedicated | 3 | Department | 3 | Dewey | 1 | dispatch | 1 | doorway | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| double | 3 | dying | 1 | elevation | 1 | enemy | 2 | especially | 6 | execution | 1 |
| doubt | 8 | | | elevator | 1 | energetic | 1 | essentially | 1 | Executives | 1 |
| doubted | 3 | each | 25 | Elias | 1 | energy | 1 | establish | 2 | executive | 9 |
| doubtful | 2 | eagerly | 1 | Eliason | 1 | enforce | 4 | established | 3 | executors | 1 |
| doubts | 1 | ear | 1 | elicited | 1 | engaged | 7 | establishing | 1 | exercised | 1 |
| Doubleday | 1 | Earl | 1 | Elijah | 1 | engagement | 1 | establishments | 1 | exhausted | 3 |
| dough | 2 | early | 13 | eliminated | 1 | engagements | 1 | estate | 7 | exhibited | 3 |
| Douglas | 2 | earn | 1 | eliminating | 1 | engine | 6 | Esther | 2 | exhibition | 4 |
| Dowie | 1 | earned | 1 | elimination | 2 | Engineer | 2 | estimate | 3 | exhibitors | 1 |
| down | 27 | earnest | 1 | Elinor | 1 | engineering | 1 | estimated | 5 | exhibits | 1 |
| downtown | 2 | earnestly | 1 | Elis | 1 | engineers | 2 | estrange | 1 | exiles | 1 |
| downward | 1 | earnestness | 1 | Elizabeth | 1 | engines | 4 | eternal | 1 | exist | 1 |
| dozen | 7 | earning | 1 | Elizabethan | 2 | England | 11 | eternity | 1 | existence | 4 |
| dozens | 1 | earnings | 2 | Elk | 3 | England's | 1 | Ethel | 1 | existing | 2 |
| dragged | 1 | earth | 4 | Elks | 2 | English | 8 | etherial | 1 | Ex-judges | 1 |
| drama | 1 | earthenware | 1 | Ella | 1 | Englishmen | 1 | Eugene | 3 | expectation | 1 |
| dramatic | 1 | earthly | 1 | Ellicott | 4 | Engle | 2 | eulogizing | 1 | expect | 2 |
| dramatized | 1 | earthquake | 1 | Elliott | 2 | engravers | 5 | eunuch | 1 | expected | 10 |
| draperies | 1 | earth's | 1 | Ellsworth | 1 | enhance | 1 | Europe | 4 | expecting | 2 |
| draw | 3 | ears | 2 | Ellwood | 1 | enjoined | 1 | European | 2 | expects | 1 |
| drawback | 1 | ease | 1 | Elmer | 2 | enjoy | 2 | Evangelical | 1 | expedition | 6 |
| drawn | 3 | easier | 4 | Elmira | 1 | enjoyed | 3 | Evelyn | 1 | expense | 3 |
| Dreadnoughts | 1 | easily | 2 | Elmwood | 1 | enjoying | 2 | even | 16 | expenses | 4 |
| dreaming | 1 | east | 3 | else | 4 | enjoyment | 2 | evening | 16 | expensive | 1 |
| dress | 1 | East | 8 | Elsie | 2 | enjoys | 1 | event | 9 | experience | 7 |
| dressed | 4 | easterly | 1 | Elsie's | 1 | en Masse | 1 | events | 11 | experienced | 1 |
| dresses | 1 | eastern | 1 | emanating | 1 | enmesh | 1 | eventual | 1 | experiments | 4 |
| drew | 2 | easy | 3 | emancipation | 1 | enough | 11 | eventually | 1 | expert | 2 |
| drill | 8 | eat | 1 | embark | 1 | enormous | 1 | ever | 28 | expired | 1 |
| drills | 2 | eccentric | 1 | embarrassing | 1 | enquire | 1 | every | 39 | expires | 1 |
| drink | 2 | echo | 1 | embassies | 2 | Enquirer | 1 | everybody | 3 | explain | 1 |
| drinkers | 1 | economical | 1 | embodied | 2 | enraged | 1 | everyone | 6 | explained | 1 |
| drinks | 2 | ecru | 1 | embodies | 1 | en Route | 1 | everything | 12 | explaining | 1 |
| Driscoll | 9 | Eddie | 1 | embrace | 1 | ensign | 1 | everywhere | 1 | explains | 1 |
| drive | 1 | edge | 1 | embraced | 1 | Ensign | 8 | evidence | 10 | explanation | 1 |
| driven | 3 | edifices | 1 | embroideries | 1 | ensued | 1 | evident | 1 | explicitly | 1 |
| driver | 4 | edition | 2 | emergency | 9 | enter | 3 | evil | 4 | exploits | 1 |
| drivers | 1 | editor | 4 | Emergency | 4 | entered | 7 | evils | 1 | explore | 2 |
| driving | 4 | editors | 1 | Emerson | 3 | entering | 1 | evolved | 1 | exploring | 1 |
| dropped | 1 | Edmund | 3 | Emil | 1 | enterprise | 2 | evolution | 1 | exponents | 1 |
| drops | 1 | Edna | 1 | eminent | 1 | enterprising | 1 | exalted | 1 | export | 1 |
| drought | 1 | Edson | 3 | eminently | 3 | enters | 2 | examination | 2 | exposed | 1 |
| drove | 1 | educating | 1 | Emma | 1 | entertain | 1 | examinations | 1 | exposure | 1 |
| drowned | 9 | education | 4 | Emmett | 1 | entertained | 4 | examine | 2 | Express | 8 |
| drowning | 3 | educational | 5 | Emperor | 2 | entertaining | 1 | examiner | 1 | express | 4 |
| Droyer | 1 | Edward | 7 | emperor | 1 | entertainment | 2 | Examiner | 2 | expressed | 6 |
| drug | 2 | Edwin | 4 | emphasis | 1 | entertainments | 3 | examining | 1 | expresses | 2 |
| drugged | 2 | effect | 17 | emphasize | 1 | entertains | 1 | example | 3 | expressing | 3 |
| druggist | 4 | effected | 2 | emphasizes | 1 | enthusiasm | 1 | excavated | 1 | exquisite | 1 |
| dry | 3 | effects | 5 | empire | 9 | enthusiastic | 1 | excavation | 2 | ex-soldier | 1 |
| Duchess | 1 | effectual | 1 | empires | 1 | entire | 7 | exceeding | 3 | extend | 1 |
| Ducky | 1 | efficient | 1 | employ | 1 | entirely | 4 | exceedingly | 1 | extended | 3 |
| ducky | 1 | efficiency | 2 | employed | 8 | entitled | 2 | excelled | 3 | extending | 1 |
| Dudly | 1 | efficiently | 1 | employee | 6 | entrance | 8 | excellent | 2 | extends | 1 |
| due | 6 | effort | 10 | employer's | 1 | entrances | 3 | except | 6 | extension | 7 |
| Duff | 1 | efforts | 5 | employment | 1 | entreaty | 1 | excepted | 2 | extensive | 2 |
| Duffy | 1 | Egloff | 1 | empress | 1 | entrusted | 1 | excepting | 2 | extent | 4 |
| dull | 1 | either | 7 | empty | 1 | enumerator | 1 | exception | 2 | extracting | 1 |
| dumb-bell | 1 | elaborate | 7 | enable | 1 | enviable | 1 | exceptional | 1 | extracts | 1 |
| dumping | 1 | elated | 1 | enacted | 1 | epidemic | 1 | exceptionally | 1 | extradite | 1 |
| Dunbar | 1 | Eleanor | 1 | encountered | 3 | equal | 2 | exceptions | 1 | extradition | 3 |
| dungeons | 1 | elect | 1 | encourage | 1 | equally | 2 | excess | 2 | extraordinarily | 1 |
| duped | 2 | elected | 7 | encouraging | 1 | equipment | 1 | excessively | 1 | extraordinary | 1 |
| during | 44 | electing | 1 | encouragement | 1 | equipped | 1 | Exchange | 4 | extravagant | 2 |
| dust | 1 | election | 19 | end | 13 | ere | 1 | exchequer | 1 | extreme | 5 |
| dusty | 1 | elector | 1 | endeavor | 1 | erect | 1 | excitedly | 1 | extremely | 3 |
| dutiable | 1 | Electric | 8 | endeavoring | 1 | erected | 3 | excitement | 3 | eye | 1 |
| duties | 8 | electric | 2 | ended | 1 | Eric | 8 | exclaimed | 1 | eyes | 4 |
| duty | 8 | electrical | 2 | ending | 1 | Erril | 1 | exclusion | 1 | | |
| dwell | 2 | electrolieres | 3 | endless | 1 | escape | 12 | exclusively | 2 | Faber | 2 |
| dwelling | 1 | element | 1 | endorsing | 1 | escaped | 9 | excommunication | 1 | face | 5 |
| dwelt | 1 | elements | 1 | ends | 4 | escapes | 3 | excuse | 2 | facile | 1 |
| dwindled | 1 | elevated | 1 | enemies | 1 | escorted | 1 | executed | 2 | facilitate | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| facilities | 4 | federation | 1 | first | 51 | forced | 1 | freedom | 2 | gang | 2 |
| fact | 22 | Federation | 1 | First | 2 | forceful | 1 | freely | 3 | Gangnagel | 1 |
| factor | 1 | fee | 2 | first-class | 1 | forces | 1 | freeze | 1 | gangs | 3 |
| factories | 1 | feel | 5 | fiscal | 1 | forcible | 1 | freezes | 1 | Ganson | 1 |
| factors | 2 | feeling | 6 | Fischer | 1 | Ford | 1 | Freidenburg | 1 | garage | 2 |
| factory | 3 | feels | 2 | Fish | 1 | forded | 1 | freight | 3 | garb | 1 |
| facts | 5 | feet | 20 | fished | 1 | forecastle | 1 | freighter | 1 | garden | 1 |
| fads | 1 | Feigenbaum | 1 | Fisher | 1 | Forecaster | 1 | freights | 1 | gardens | 1 |
| fail | 1 | fell | 5 | fishing | 5 | forego | 1 | French | 13 | Gardenville | 1 |
| failed | 4 | felled | 1 | fissure | 1 | foregone | 1 | frequency | 1 | Gardiner | 1 |
| failing | 6 | fellow | 4 | fists | 1 | forehead | 1 | frequent | 2 | garments | 1 |
| failure | 4 | Fellows | 1 | fit | 1 | foreign | 8 | frequently | 2 | gas | 5 |
| fainting | 1 | felony | 1 | fitness | 1 | foreigner's | 1 | fresh | 5 | gasoline | 1 |
| fair | 18 | felt | 2 | fitted | 1 | forenoon | 2 | Frick | 1 | gate | 2 |
| fairly | 1 | female | 1 | Fitzmaurice | 2 | forest | 1 | Friday | 8 | gatekeeper | 1 |
| faith | 2 | feminine | 2 | Fitzpatrick | 2 | Forest | 1 | fried | 4 | gatekeepers | 2 |
| faithfully | 1 | Ferdinand | 1 | Five | 1 | forests | 2 | friend | 5 | gates | 2 |
| Falk | 7 | Ferrel | 1 | fix | 4 | forfeit | 2 | friendliness | 2 | gathered | 4 |
| Falk's | 1 | ferry | 1 | fixed | 4 | forget | 5 | friendly | 1 | gathering | 1 |
| fall | 13 | Ferry | 1 | fixture | 1 | forgotten | 2 | friend's | 1 | gathers | 1 |
| falls | 5 | fertilize | 1 | flag | 5 | form | 17 | friends | 24 | gave | 9 |
| Falls | 9 | fertilizing | 1 | Flagg | 1 | formalities | 1 | friction | 1 | Gavin | 1 |
| Fallieres | 3 | Fertilizing | 1 | flags | 2 | formation | 1 | fright | 1 | Gaw | 1 |
| false | 4 | festival | 1 | flagship | 1 | formed | 6 | frightened | 1 | Gaynor | 5 |
| falsehood | 1 | fetched | 2 | flamed | 1 | former | 12 | Frisco | 1 | Gaynor's | 1 |
| fame | 2 | fever | 1 | flames | 6 | formerly | 1 | frocks | 2 | gazed | 2 |
| familiar | 1 | few | 20 | Flanigan | 1 | formidable | 1 | from | 255 | Geisen | 1 |
| family | 15 | Fiat | 4 | flashed | 1 | forms | 1 | front | 11 | gem | 1 |
| famine | 2 | fiction | 2 | flattering | 1 | forth | 2 | frontage | 3 | gems | 1 |
| famous | 12 | Field | 1 | fleeced | 1 | forthcoming | 3 | frosts | 1 | general | 12 |
| fan | 1 | field | 12 | fled | 3 | fortnight | 3 | frown | 1 | General | 10 |
| fancies | 1 | fields | 4 | fleeing | 1 | fortune | 9 | fruit | 3 | Generation | 2 |
| fancy | 2 | fierce | 1 | fleet | 5 | fortunate | 1 | fruits | 1 | generous | 1 |
| fanned | 2 | fiercely | 1 | Fleet | 1 | fortunes | 1 | Frye | 3 | Genesee | 6 |
| far | 25 | fiction | 2 | Fleischman | 1 | forward | 5 | fuel | 1 | Geneva | 1 |
| farce | 6 | Fifteenth | 1 | Fletcher | 1 | forwarded | 1 | Fuerte | 1 | genial | 1 |
| farm | 1 | fight | 5 | flexibility | 1 | Foster | 1 | Fuhrman | 1 | genially | 1 |
| farmer | 2 | fighting | 4 | flies | 1 | fought | 2 | fugitive | 1 | Genoa | 1 |
| farmers | 3 | figuratively | 1 | flight | 8 | foulard | 1 | full | 9 | gentle | 2 |
| farms | 1 | figure | 4 | Flint | 1 | Foulois | 7 | fully | 1 | gentlemen | 2 |
| Farnham | 1 | figured | 3 | flood | 1 | found | 40 | Fulton | 2 | genuineness | 1 |
| farther | 1 | figures | 3 | flooding | 1 | founded | 1 | fun | 1 | George | 27 |
| fashion | 1 | file | 1 | floods | 2 | foundered | 1 | fund | 6 | Georgia | 7 |
| fashionable | 1 | filed | 7 | floor | 5 | founding | 1 | funds | 1 | Georgian | 1 |
| fashions | 1 | files | 1 | floors | 2 | Fouquet | 1 | funeral | 8 | German | 12 |
| fast | 2 | filing | 1 | Florence | 1 | Fourth | 1 | furnish | 2 | Germania | 2 |
| fastens | 1 | fill | 6 | Flower | 1 | Fourteenth | 1 | furnished | 3 | Germany | 9 |
| fat | 2 | filled | 5 | flower | 8 | Fox | 2 | furniture | 1 | get | 18 |
| fate | 5 | final | 7 | flowers | 11 | fractional | 1 | furs | 1 | getting | 11 |
| fatal | 3 | finally | 2 | flowing | 4 | fracture | 1 | furry | 2 | gets | 5 |
| fatally | 2 | finance | 1 | Floyd | 1 | fractured | 2 | further | 10 | Gettysburg | 1 |
| father | 15 | financial | 6 | Flushing | 1 | frail | 1 | fusion | 1 | ghastly | 1 |
| fathers | 1 | financier | 1 | fly | 1 | Fraize | 1 | futility | 1 | gifts | 1 |
| fatuous | 1 | find | 7 | flyer | 2 | framed | 2 | future | 6 | Girard | 1 |
| favor | 10 | finding | 4 | flying | 1 | franchise | 2 | | | Girl | 2 |
| favorable | 1 | fine | 10 | fog | 1 | Francis | 4 | gaieties | 1 | girl | 11 |
| favorably | 1 | fined | 3 | Folios | 1 | Francisco | 4 | gaily | 1 | girls | 21 |
| favored | 2 | finer | 2 | folk | 2 | Franco-Italian | 1 | gain | 1 | give | 17 |
| favorite | 4 | finest | 2 | folks | 1 | Franco-German | 1 | gained | 4 | given | 30 |
| Faust | 2 | finger | 4 | Follette | 1 | Frank | 17 | Gagnon | 1 | gives | 3 |
| Fay | 1 | finish | 3 | follow | 6 | Frankel | 1 | gale | 1 | giving | 5 |
| fear | 3 | finished | 4 | followed | 6 | Franklin | 2 | gales | 2 | glace | 1 |
| feared | 3 | Fink | 3 | following | 13 | frankness | 1 | Galilee | 1 | glacier | 3 |
| fearing | 1 | Finland | 1 | follows | 5 | fraternal | 2 | gallantry | 2 | glad | 1 |
| fearless | 1 | Finnegan | 1 | fond | 1 | Fraternal | 1 | galleries | 9 | Gladys | 1 |
| feature | 5 | fire | 16 | fondly | 2 | fraternity | 2 | gallery | 1 | Glasgow | 2 |
| featured | 1 | fired | 2 | Fontenay | 1 | fraternizes | 1 | Galligan | 1 | Glass | 1 |
| features | 12 | fireman | 1 | food | 6 | frauds | 1 | gallon | 1 | Gleason | 1 |
| Fechter | 1 | firemen | 3 | foot | 7 | Fred | 4 | Gamble | 1 | Glen | 1 |
| fecundity | 1 | firmer | 1 | for | 557 | Frederick | 9 | gambling | 2 | glen | 1 |
| fed | 1 | firm | 5 | forbid | 1 | Frederickhof | 1 | game | 7 | Glidden | 1 |
| Federal | 1 | firms | 3 | forbids | 1 | Fredonia | 2 | Game | 1 | glided | 1 |
| federal | 3 | | | force | 4 | free | 11 | games | 3 | glimpses | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| glistening | 1 | grave | 3 | half-melted | 1 | hatred | 1 | higher | 2 | hospital | 9 |
| glittering | 1 | Graves | 1 | Halifax | 2 | Haute | 3 | highest | 5 | Hospital | 13 |
| Globe | 1 | gray | 2 | hall | 4 | have | 245 | highly | 1 | hospitality | 1 |
| gloomy | 1 | Great | 6 | Hall | 7 | having | 24 | high-minded | 1 | hospitals | 5 |
| glove | 1 | great | 49 | halt | 2 | havoc | 1 | highway | 4 | host | 2 |
| gloves | 4 | greater | 2 | halts | 1 | Havana | 2 | highwaymen | 1 | hosts | 1 |
| glowing | 1 | greatest | 8 | Hamburg | 8 | Havre | 1 | hill | 1 | hot | 4 |
| glows | 2 | greatly | 2 | Hamid | 2 | Hawk | 8 | Hill | 2 | hotel | 3 |
| go | 19 | Greece | 4 | Hamilton | 1 | Hawkeye | 2 | hills | 1 | hotels | 1 |
| goat | 1 | Greece-Cretan | 1 | Hammerstein | 1 | Haynes | 1 | hillsides | 1 | hour | 15 |
| goats | 2 | Greek | 3 | hammock | 3 | hazarded | 1 | him | 83 | hours | 19 |
| goes | 8 | green | 1 | hammocks | 2 | hazed | 1 | himself | 17 | house | 48 |
| going | 9 | Greenland | 1 | Hammond | 4 | Hazelton | 1 | Hinckley | 1 | housed | 1 |
| gold | 2 | Greenwich | 1 | Hammondsport | 2 | he | 357 | Hinman-Green | 4 | household | 2 |
| Goldsmid | 1 | greets | 1 | Hambton | 1 | head | 29 | Hinsdale | 1 | housekeeper | 1 |
| goldsmith | 1 | Gregory | 1 | hand | 10 | Headquarters | 1 | hip | 1 | housemaid | 1 |
| golf | 1 | Gretchen | 1 | handed | 2 | heads | 1 | hips | 1 | houses | 6 |
| gone | 8 | grew | 4 | handful | 1 | headway | 2 | hippodromed | 1 | Houses | 1 |
| good | 37 | grilling | 3 | Handiger | 1 | heal | 1 | hire | 1 | hovering | 1 |
| Goodale | 1 | Grimm | 3 | handiwork | 1 | health | 5 | hired | 1 | how | 24 |
| good-fellowship | 1 | grip | 1 | handlebars | 1 | healthy | 1 | his | 321 | Howard | 5 |
| goodly | 1 | grips | 1 | hands | 12 | heap | 2 | historic | 1 | however | 20 |
| goods | 2 | gross | 1 | handsome | 4 | hear | 7 | historical | 1 | howling | 1 |
| Gordon | 1 | Grosse | 2 | handsomest | 1 | heard | 12 | history | 9 | Hoyt | 3 |
| Gorem | 4 | Grotto | 1 | handwriting | 2 | hearing | 7 | History | 2 | Hudson | 8 |
| Gorge | 1 | ground | 15 | hang | 2 | heart | 6 | hit | 2 | Hudson-Fulton | 1 |
| Gorman | 1 | grounds | 11 | hanged | 2 | hearts | 3 | hitherto | 1 | Hugh | 3 |
| gospel | 2 | group | 2 | hanging | 1 | hearty | 2 | hits | 1 | Hughes | 6 |
| gossip | 3 | grouping | 2 | hangman | 1 | heat | 1 | Hoboken | 1 | hulk | 1 |
| got | 6 | grouse | 1 | Hanley | 1 | heavily | 1 | Hoffman | 1 | human | 1 |
| govern | 1 | grow | 2 | Hanson | 1 | heavy | 5 | Hogarth | 1 | humanity | 2 |
| governed | 1 | grower | 1 | happen | 5 | Hebey | 1 | hold | 5 | hummock | 1 |
| Governeur | 1 | growers | 1 | happenings | 1 | heed | 1 | Holden | 1 | humor | 4 |
| governing | 1 | growing | 3 | happens | 1 | heels | 1 | holder | 2 | humorists | 2 |
| government | 19 | grown | 3 | happily | 2 | height | 5 | Holder | 3 | Humorists | 1 |
| governments | 3 | growth | 2 | happy | 1 | heights | 1 | holders | 1 | humorously | 1 |
| Governor | 11 | grub | 1 | Harbor | 1 | Heilbroon | 1 | holding | 4 | humors | 1 |
| governor | 2 | grubbing | 1 | Harbormaster | 1 | Heilbroon's | 1 | holds | 1 | Humphrey | 1 |
| governors | 1 | grumbling | 1 | hard | 11 | held | 41 | hole | 2 | hungry | 1 |
| gown | 1 | guarantees | 1 | hardest | 1 | Helen | 2 | holes | 3 | Hunt | 1 |
| gowns | 1 | guard | 2 | hardly | 2 | Hellreigel | 1 | Holmes | 3 | hunted | 2 |
| grace | 1 | guardian | 4 | hardship | 1 | help | 5 | Holmeses | 1 | hunters | 1 |
| graced | 1 | guarded | 3 | hardy | 1 | helped | 1 | Holt | 4 | hunting | 2 |
| gracefully | 3 | guardhouse | 1 | harm | 1 | helpless | 1 | Holy | 1 | Huntly | 1 |
| graces | 1 | Guenthner | 4 | harmonize | 1 | Hempstead | 1 | home | 27 | hurled | 1 |
| graciously | 1 | guess | 4 | Harold | 1 | hence | 2 | homeless | 1 | Hurrell | 1 |
| grade | 1 | guest | 2 | Harpers | 2 | Henessy | 1 | Homeopathic | 1 | hurried | 4 |
| graded | 1 | guests | 12 | Harpst | 1 | Henry | 26 | homeowners | 1 | hurt | 4 |
| gradually | 1 | Gueydon | 1 | Har.is | 6 | Henshall | 1 | homes | 3 | husband | 15 |
| graduate | 1 | guides | 2 | Harrison | 5 | Hepselgrave | 1 | honest | 1 | Hutt | 1 |
| graduated | 1 | gun | 1 | Harrison's | 1 | her | 119 | honor | 5 | hybrid | 1 |
| Grady | 5 | guns | 2 | Harry | 6 | Herbert | 8 | Honor | 1 | hybrids | 1 |
| Grady's | 1 | gusts | 1 | Hart | 1 | here | 36 | honored | 1 | hydraulic | 1 |
| Graham | 1 | gymnasium | 1 | Hartke | 1 | hereby | 1 | honors | 3 | hygiene | 1 |
| grain | 2 | gymnastic | 3 | Hartley | 2 | Hereford's | 1 | Hooker | 4 | hygienic | 1 |
| grammars | 1 | | | Hartzell | 1 | Herman | 3 | Hope | 7 | hypocrisy | 3 |
| grand | 9 | Haas | 1 | harvest | 4 | heroism | 1 | hope | 7 | hypocrite | 1 |
| Grand | 3 | habit | 2 | harvesting | 1 | Herring | 1 | hoped | 2 | hypnotized | 2 |
| grander | 2 | hacked | 1 | Harvy | 1 | herself | 5 | hopeful | 1 | hysterical | 1 |
| grandest | 1 | hacking | 1 | has | 231 | hesitate | 1 | hopefully | 1 | | |
| grandson | 1 | had | 158 | Haskell | 2 | Hesse | 1 | hopeless | 2 | I | 113 |
| Grange | 1 | Haffa | 1 | Haskins | 1 | Hesselman | 3 | hopes | 3 | ice | 10 |
| granite | 1 | Haggerty | 1 | Hass | 3 | Hessian | 2 | hoping | 1 | Idaho | 1 |
| Grant | 2 | Hagman | 4 | haste | 1 | Hever | 6 | horizon | 2 | idea | 6 |
| grant | 1 | Hahl | 1 | hastened | 1 | Hicky | 1 | horrible | 1 | ideal | 1 |
| granted | 10 | Hahl's | 1 | hastening | 1 | Hickory | 1 | Hornung | 1 | ideals | 1 |
| Graphic | 1 | hails | 1 | hastens | 1 | hid | 2 | horse | 6 | ideas | 1 |
| graphically | 1 | Haines | 2 | hastily | 1 | hidden | 1 | horseman | 1 | identified | 3 |
| grappling | 1 | hair | 6 | hasty | 1 | hides | 1 | horsepower | 3 | identify | 1 |
| grass | 1 | Halbin | 3 | hat | 2 | hiding | 1 | horses | 6 | identity | 2 |
| Grass | 1 | Hale | 1 | Hatch | 1 | Higgins | 1 | horticulturists | 1 | idol | 1 |
| gratefully | 1 | half | 15 | hated | 1 | high | 19 | hose | 1 | if | 73 |
| Gratwick | 1 | half-crazed | 1 | | | high-class | 1 | hosiery | 7 | ignore | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ignored | 2 | India | 1 | installed | 1 | involve | 1 | judge | 1 | Kirk | 6 |
| ill | 8 | Indian | 1 | installing | 1 | Iowa | 1 | judged | 1 | Kirk's | 2 |
| illegal | 5 | Indiana | 1 | installment | 1 | irrelevant | 1 | judges | 9 | Kirkwood | 1 |
| Illinois | 2 | Indianapolis | 1 | instance | 5 | irresistably | 1 | judgment | 2 | kite | 1 |
| illness | 2 | Indians | 1 | instances | 2 | Isaac | 1 | jug | 1 | kites | 1 |
| illuminated | 1 | indicate | 5 | instant | 2 | Ishpenning | 1 | Julia | 1 | Kittery | 1 |
| illumination | 1 | indicated | 2 | instantly | 2 | Island | 3 | July | 86 | Kitty | 1 |
| illustrate | 1 | indication | 1 | instead | 5 | island | 2 | junior | 1 | Klopp | 1 |
| illustrated | 2 | indications | 1 | instigation | 1 | islands | 2 | jurisdiction | 2 | Klotz | 1 |
| illustrates | 2 | indicted | 2 | institute | 2 | issue | 1 | jury | 1 | Knapp | 7 |
| illustration | 1 | indictment | 1 | instituting | 1 | issued | 15 | just | 33 | Knapp's | 1 |
| illustrations | 1 | indignation | 1 | institution | 2 | issues | 2 | Justice | 6 | kneaded | 1 |
| illustrative | 1 | indiscreet | 1 | instructed | 1 | issuing | 2 | justice | 6 | knee | 1 |
| imagine | 2 | indiscriminately | 1 | instructions | 1 | is | 641 | justifiable | 2 | knew | 4 |
| imaginative | 1 | indispensable | 1 | instructive | 1 | it | 433 | justification | 2 | Knight | 1 |
| immediate | 6 | individual | 1 | instructor | 1 | Italian | 2 | justified | 1 | Knight's | 1 |
| immediately | 7 | individuals | 1 | instrument | 1 | items | 1 | justifying | 1 | knocked | 2 |
| immense | 4 | indorsed | 1 | insufficient | 1 | its | 73 | Justin | 1 | knocks | 1 |
| immorality | 2 | indulge | 2 | insurance | 4 | itself | 9 | | | knot | 1 |
| immortal | 1 | industry | 2 | insure | 1 | | | Kaiser | 1 | know | 21 |
| imperatively | 1 | inevitable | 1 | insurgents | 1 | Jackies | 4 | Kane | 1 | knowing | 1 |
| imperial | 10 | inevitably | 1 | intake | 1 | Jackson | 5 | Kanitovski | 1 | knowledge | 1 |
| Imperial | 1 | inexcusable | 1 | intellectual | 1 | Jacob | 2 | Kansas | 4 | Knowlton | 2 |
| implacable | 1 | Infante | 1 | intelligence | 1 | jail | 7 | Karline | 1 | known | 17 |
| import | 1 | inferior | 1 | intend | 1 | James | 16 | Katherine | 1 | knows | 6 |
| importance | 4 | inferred | 1 | intended | 6 | Jamestown | 1 | Katrine | 1 | Knoxville | 1 |
| important | 10 | inflicted | 1 | intends | 3 | Jan | 1 | Keefe | 1 | Koach | 1 |
| imports | 1 | influence | 3 | intensely | 1 | Janeiro | 1 | Keeler | 1 | Koenig | 1 |
| imposed | 2 | influences | 1 | intention | 4 | janitors | 1 | keener | 1 | Koerber | 1 |
| imposing | 1 | inform | 1 | intentions | 1 | Japan | 2 | keep | 6 | Kranes | 1 |
| imposition | 1 | informal | 1 | intents | 1 | Japanese | 8 | keeper | 3 | Krehbiel | 1 |
| impossible | 11 | informality | 1 | interchange | 2 | Jarabub | 1 | Keeper | 1 | Kreitzbender | 2 |
| impossibility | 1 | information | 14 | interest | 16 | Jean | 2 | keeping | 3 | Krishnavarma | 1 |
| impostor | 1 | informed | 1 | interested | 5 | Jeanne | 2 | keeps | 1 | Kronprinz | 1 |
| impress | 1 | Inglis | 1 | interesting | 6 | Jeannette | 1 | Kellerman | 1 | Kuhlinka | 2 |
| impressed | 2 | Ingram | 1 | interests | 1 | Jefferson | 2 | Kelly | 2 | Kusterer | 5 |
| impression | 2 | inhabitants | 2 | interfere | 1 | Jennie | 1 | Kenmore | 1 | | |
| imprison | 1 | inherited | 1 | interfering | 2 | Jeremiah | 2 | Kennedy | 1 | La | 8 |
| imprisoned | 4 | inhospitable | 1 | interior | 2 | Jerge | 2 | Kennedy's | 1 | Labor | 1 |
| imprisonment | 3 | injected | 1 | interlocutory | 2 | Jerrold | 1 | Kenngott | 2 | labor | 3 |
| improbable | 1 | injunction | 18 | Intermezzo | 1 | Jersey | 1 | Kenren | 1 | laboratories | 1 |
| improve | 1 | injunctions | 1 | International | 1 | Jesse | 2 | Kentucky | 2 | laboratory | 1 |
| improved | 1 | injured | 20 | interplayground | 1 | Jessel | 1 | kept | 6 | laborer | 1 |
| improvement | 3 | injuries | 4 | interpretation | 1 | Jesuit | 1 | Kern | 1 | laborers | 1 |
| improvements | 4 | injury | 2 | interpreters | 1 | jet | 1 | Ketchum | 1 | labors | 2 |
| impudence | 1 | injustice | 1 | interrupted | 1 | jeweler | 1 | kick | 1 | lace | 4 |
| in | 1072 | inland | 3 | interurban | 1 | jewelry | 4 | kicked | 1 | laced | 2 |
| inability | 3 | Inn | 1 | interval | 1 | jewels | 4 | kicks | 1 | lack | 2 |
| inadvisable | 1 | inner | 2 | intervals | 1 | Jewish | 6 | kill | 4 | Lackawana | 1 |
| incentive | 1 | innocence | 1 | interview | 2 | Jews | 6 | killed | 23 | lad | 2 |
| incessantly | 1 | innocent | 1 | intimated | 1 | Jimmy | 1 | Killeen | 3 | ladies' | 1 |
| inches | 1 | innovation | 1 | intimates | 1 | job | 2 | killing | 4 | ladies | 2 |
| incident | 2 | inquire | 1 | intimation | 1 | jobs | 1 | kills | 4 | lady | 1 |
| incidental | 1 | inquiries | 1 | into | 64 | Joe | 4 | kilometers | 1 | Lady | 1 |
| incidentally | 2 | inquiry | 2 | intolerable | 1 | Joel | 1 | Kilroy | 1 | Lafayette | 1 |
| incidents | 1 | insane | 9 | intrepid | 1 | John | 52 | Kimberly | 1 | Laffan | 1 |
| inclined | 1 | inscription | 1 | introduced | 5 | John's | 1 | Kinch | 1 | laid | 3 |
| include | 3 | inserts | 1 | introduces | 2 | Johnson | 10 | kind | 13 | Lailoz | 1 |
| included | 6 | inside | 7 | introducing | 1 | Johnson's | 2 | kindergarten | 1 | Lake | 5 |
| includes | 2 | insides | 1 | invades | 1 | Johnston | 1 | kindhearted | 1 | lake | 8 |
| including | 5 | insist | 2 | invading | 1 | Johnston's | 1 | kinds | 3 | Lakes | 2 |
| income | 9 | insisted | 1 | invariably | 1 | join | 2 | king | 4 | lakes | 6 |
| incomplete | 1 | insistence | 1 | invasion | 1 | joining | 1 | kingdom | 1 | Lamballe | 1 |
| incorporated | 1 | insisting | 2 | inventors | 1 | Jose | 2 | kingdoms | 1 | Lambeso | 1 |
| increase | 4 | insists | 1 | investigate | 4 | Joseph | 4 | Kingsley | 1 | lamented | 1 |
| increased | 3 | insolent | 1 | investigated | 2 | Joseph's | 1 | Kingson | 1 | Lancaster | 3 |
| increases | 4 | inspect | 1 | investigation | 5 | Journal | 2 | Kingson's | 1 | land | 10 |
| increasing | 3 | inspected | 2 | investment | 1 | journey | 4 | Kinkead | 1 | Landgrave | 1 |
| increasingly | 3 | inspection | 2 | invitation | 6 | journey's | 1 | kinky | 1 | landing | 3 |
| indebted | 2 | inspector | 1 | invitations | 3 | Jove | 1 | | | landlord | 1 |
| indeed | 1 | Inspector | 1 | invite | 1 | joy | 1 | | | lands | 1 |
| independence | 2 | inspired | 1 | invited | 3 | Joyce | 3 | | | landslide | 1 |
| independent | 5 | install | 1 | invites | 1 | Judge | 2 | | | Lane | 1 |
| | | installation | 1 | | | | | | | | |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| language | 2 | leg | 5 | liquor | 8 | Louise | 1 | Malmros | 1 | Matamoras | 1 |
| languages | 1 | legacy | 2 | liquors | 1 | Louisana | 3 | Mallon | 1 | match | 2 |
| Lanigan | 1 | legacies | 1 | list | 7 | Louisville | 1 | Malone | 3 | material | 3 |
| Lanner | 1 | legal | 4 | listened | 1 | Lourdes | 1 | Maloney | 1 | materialized | 1 |
| larceny | 4 | legend | 2 | lists | 3 | Love | 1 | maltreatment | 1 | mathematics | 1 |
| large | 21 | legislate | 1 | literature | 3 | love | 4 | Malthus | 1 | Matildy | 1 |
| largely | 2 | legislation | 1 | litigants | 1 | loved | 2 | man | 12 | matrimonial | 1 |
| larger | 2 | legislative | 2 | Little | 1 | lovers | 1 | man's | 7 | matrimony | 1 |
| largest | 6 | legislature | 2 | little | 42 | loving | 1 | Man | 1 | matron | 5 |
| Larned | 1 | Legislature | 2 | Lituna | 1 | Lovejoy | 1 | managed | 1 | matter | 19 |
| lassitude | 1 | legitimate | 2 | live | 15 | low | 4 | management | 1 | matters | 4 |
| last | 77 | Lehigh | 5 | lived | 4 | lower | 4 | manager | 2 | Matty | 1 |
| lasted | 2 | length | 9 | lively | 1 | lowest | 3 | managers | 2 | Maud | 2 |
| lasting | 1 | lengths | 1 | lives | 11 | loyal | 1 | manifestly | 1 | Maul | 1 |
| last-named | 1 | lengthy | 2 | living | 7 | loyalty | 1 | manifold | 1 | Maur | 1 |
| lasts | 1 | Lennon | 2 | Livonia | 1 | Lozier | 1 | Manitoba | 1 | maximum | 4 |
| late | 22 | Leo | 1 | Llanisca | 1 | luck | 1 | manned | 2 | may | 50 |
| lately | 1 | Leon | 7 | Lloyd | 2 | luckless | 1 | manner | 8 | May | 5 |
| later | 12 | Leroy | 1 | load | 1 | lucky | 1 | manners | 1 | Maybell | 1 |
| latest | 5 | Lescaul | 1 | loaded | 3 | Lucy | 1 | manoeuvers | 3 | Mayer | 1 |
| latitude | 1 | Leslie | 1 | loaned | 2 | Ludlow | 1 | Manrizo | 1 | Maynihan | 1 |
| latter | 6 | less | 18 | local | 9 | Lukens | 1 | mantle | 1 | Mayor | 12 |
| laugh | 1 | lesson | 2 | localities | 1 | lumber | 6 | mantles | 1 | mayor | 9 |
| laughter | 1 | lessened | 1 | locality | 1 | Luna | 1 | manufacture | 1 | Mayoralty | 3 |
| Laughlin | 1 | let | 10 | locate | 1 | lunch | 1 | manufacturer | 1 | mazes | 1 |
| launch | 1 | letter | 19 | located | 1 | luncheon | 2 | manufacturer's | 1 | Mazurka | 1 |
| launches | 1 | letters | 9 | locating | 1 | Luninger | 1 | manufacturing | 1 | McAdoo | 1 |
| Laurel | 1 | level | 3 | location | 1 | Lupfer | 1 | Manzano | 1 | McCarthy | 3 |
| Laurent | 1 | levy | 1 | Locke | 1 | lurching | 1 | many | 52 | McCartney | 1 |
| Lahrentic | 1 | Lewiston | 1 | locked | 5 | lured | 1 | map | 2 | McCartney's | 1 |
| lava | 2 | Libau | 1 | lockjaw | 2 | lurk | 2 | marble | 2 | McClellan | 6 |
| law | 20 | libel | 1 | lockout | 1 | luxury | 2 | Marcellus | 3 | McClure | 5 |
| Law | 1 | liberal | 2 | Lockport | 7 | lying | 6 | March | 2 | McCue | 1 |
| Lawn | 1 | Liberal | 1 | locks | 2 | lynch | 1 | march | 2 | McCullen | 1 |
| lawn | 1 | liberality | 1 | Locomotive | 1 | lynching | 1 | marched | 2 | McCulloch | 1 |
| Lawrence | 4 | Liberals | 1 | lodge | 2 | Lyons | 1 | Margaret | 4 | McDonald | 8 |
| laws | 7 | liberty | 1 | Lodge | 2 |  |  | Mariana | 2 | McDonough | 1 |
| lawyer | 2 | license | 2 | Loftus | 1 | macadam | 1 | Marie | 3 | McDowell | 1 |
| Lawyer | 1 | Lichliter | 1 | London | 18 | MacGregor | 1 | Marine | 1 | McGuire | 2 |
| Lawyers | 1 | lid | 1 | Londoner | 1 | machine | 8 | marine | 6 | McKee | 1 |
| lawyers | 1 | lie | 2 | Londoners | 1 | machinery | 5 | mariners | 1 | McKenney | 1 |
| lay | 6 | lies | 6 | London's | 1 | Mack | 1 | Maritana | 1 | McKenzie | 3 |
| laying | 1 | lieutenant | 1 | long | 47 | Mackinaw | 1 | mark | 3 | McKeever | 1 |
| lazy | 1 | Lieutenant | 2 | Long | 5 | mad | 3 | marked | 2 | McKinley | 1 |
| lead | 12 | life | 26 | Longe | 1 | made | 90 | markedly | 1 | McLeod | 3 |
| leader | 8 | lifting | 1 | Longshoremen's | 1 | Madison | 1 | market | 3 | McNair | 1 |
| Leader | 3 | light | 6 | long-struggling | 1 | Madrid | 3 | marks | 2 | me | 17 |
| leaders | 1 | lighted | 4 | longer | 7 | Magazine | 1 | Maron | 1 | meal | 2 |
| leading | 5 | lightest | 1 | longest | 2 | magistrate | 1 | Marquise | 1 | mean | 1 |
| leadership | 2 | lightning | 1 | lonely | 3 | Magnes | 4 | marriage | 13 | means | 14 |
| leads | 4 | lights | 2 | look | 6 | Magnes' | 1 | marriages | 1 | meant | 3 |
| league | 4 | like | 21 | looked | 5 | magnetism | 1 | married | 6 | meantime | 3 |
| League | 2 | likely | 6 | looking | 8 | magnificent | 2 | marrying | 1 | measure | 4 |
| leap | 2 | likewise | 1 | Lookout | 1 | Mahoney | 2 | Marsellaise | 1 | measured | 1 |
| leaped | 1 | liking | 1 | looks | 5 | maid | 1 | Marseilles | 1 | measures | 5 |
| leaps | 1 | Lilac | 1 | loose | 1 | Maid | 1 | Marshal | 1 | meat | 1 |
| learn | 4 | Liliputian | 1 | loosely | 1 | mail | 5 | Marshall | 1 | mechanics | 1 |
| learned | 9 | limbs | 1 | loosened | 1 | main | 4 | Marshes | 1 | medal | 15 |
| Leary | 2 | limit | 2 | looted | 1 | Main | 4 | Martin | 3 | medals | 1 |
| least | 16 | limited | 1 | Lord | 11 | maintain | 2 | martyr | 2 | medical | 4 |
| leather | 1 | Limited | 2 | Lord's | 1 | Maine | 1 | marvelous | 1 | Medical | 5 |
| leave | 10 | limits | 2 | Lorenzo | 1 | mainly | 1 | Mary | 9 | medicine | 1 |
| leaves | 3 | limp | 1 | Los | 3 | mains | 1 | Maryland | 1 | medium | 3 |
| leaving | 7 | Lincoln | 2 | Losel | 1 | Major | 6 | Mary's | 3 | meet | 8 |
| lecture | 2 | Linden | 1 | loses | 4 | majority | 14 | Maryville | 1 | meeting | 15 |
| lecturing | 1 | line | 10 | loss | 9 | majorities | 1 | masculine | 1 | meetings | 1 |
| led | 5 | Line | 1 | lost | 19 | make | 40 | Mason | 2 | melancholy | 1 |
| Ledger | 1 | lined | 1 | lot | 6 | maker | 2 | masonry | 1 | Melaney | 1 |
| Lee | 3 | linen | 2 | Loti's | 1 | makers | 1 | mass | 3 | Mellier | 1 |
| Leerburger | 1 | lineman | 1 | Lou | 1 | maker's | 1 | Massachusetts | 4 | Melilla | 4 |
| Leffert | 2 | lines | 7 | loud | 1 | makes | 9 | masses | 1 | melody | 2 |
| Leffert's | 2 | Ling | 1 | loudly | 1 | making | 17 | mast | 1 | melted | 1 |
| left | 32 | Ling's | 2 | Louis | 17 | male | 1 | master | 3 | melting | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Melvin | 1 | minds | 1 | months' | 1 | Myers | 2 | New | 65 | notified | 4 |
| member | 14 | mine | 5 | Montreal | 5 | Myron | 1 | Neward | 1 | notify | 1 |
| members | 36 | mineral | 1 | Mooney | 2 | myself | 4 | newest | 1 | notifying | 1 |
| membership | 1 | Minerva | 1 | Moore | 3 | mysterious | 3 | news | 11 | notion | 1 |
| memorial | 3 | mining | 3 | mooring | 1 | mysteriously | 1 | News | 13 | notoriety | 2 |
| memory | 3 | minimum | 4 | Moors | 2 | mystery | 1 | newspaper | 5 | notorious | 1 |
| men | 78 | minister | 4 | Moran | 1 | mystic | 1 | newspaper's | 2 | notoriously | 2 |
| Men | 1 | ministers | 1 | more | 73 |  |  | newspapers | 8 | Notre | 1 |
| Mene | 3 | ministrations | 1 | Morella | 1 | nabbed | 1 | Newton | 5 | notwithstanding | 4 |
| Mene's | 1 | ministry | 2 | moreover | 2 | Nagata | 1 | Newton's | 1 | nourished | 1 |
| men's | 2 | Minneapolis | 1 | Morgan | 3 | nail | 1 | next | 27 | novel | 5 |
| Men's | 1 | Minnesota | 1 | morning | 31 | naked | 1 | Nez | 1 | novels | 1 |
| Menn | 4 | minor | 1 | morning's | 1 | name | 21 | Niagara | 15 | novelty | 2 |
| mental | 2 | minority | 3 | Morris | 5 | named | 8 | nice | 2 | November | 1 |
| mention | 1 | Minority | 1 | Morse | 3 | names | 8 | Nicholas | 1 | now | 60 |
| mentioned | 4 | minors | 1 | Moses | 2 | namely | 2 | Nicholson | 1 | Nowak | 1 |
| merchant | 2 | minute | 2 | Mosher | 1 | naming | 1 | Nicolas | 1 | nucleus | 2 |
| mercury | 1 | minutes | 4 | Mosier | 1 | narrated | 1 | nickelodeons | 2 | Nugat | 1 |
| mercy | 1 | miraculously | 1 | most | 47 | narrative | 1 | nickels | 1 | nuisance | 1 |
| mere | 3 | mirage | 1 | mostly | 1 | narrow | 2 | night | 42 | number | 20 |
| Meredith | 1 | mirror | 2 | mother | 17 | narrowly | 1 | Night | 1 | numbered | 1 |
| Meredith's | 3 | mirth | 1 | motherland | 1 | nation | 6 | nightly | 1 | numberless | 1 |
| merely | 4 | misappropriating | 2 | mother's | 3 | national | 20 | Ninth | 1 | numbers | 11 |
| Meridian | 2 | mischief | 1 | motion | 7 | National | 10 | nipping | 1 | numerical | 1 |
| merits | 1 | misconduct | 1 | motives | 1 | Nationalists | 1 | nips | 1 | numerous | 2 |
| merry | 1 | misdemeanor | 2 | motor | 4 | nationalities | 2 | no | 101 | nurses | 5 |
| messenger | 1 | misgivings | 1 | motorcycle | 4 | nations | 2 | nobility | 3 | nursing | 1 |
| met | 6 | mishap | 1 | motorist | 1 | native | 1 | noble | 4 |  |  |
| metal | 2 | misrepresent | 1 | motorists | 1 | natives | 2 | nobler | 1 | oak | 1 |
| Metcalfe | 1 | missing | 5 | motorman | 2 | natural | 3 | nobly | 1 | oasis | 1 |
| meteorological | 1 | mission | 2 | motors | 2 | nature | 3 | nobody | 5 | obey | 1 |
| meters | 2 | missionary | 1 | Mount | 1 | naught | 1 | nod | 1 | obeyed | 1 |
| Methodist | 1 | Mississippi | 3 | Mountain | 1 | naval | 9 | Nodarse | 2 | object | 3 |
| method | 1 | Missouri | 1 | mountain | 8 | Naval | 1 | Nodarse's | 1 | objected | 1 |
| methods | 4 | mistake | 4 | mountaineers | 1 | Navarro | 1 | noise | 1 | objection | 5 |
| metropolis | 1 | mistaken | 2 | mountains | 4 | navigating | 1 | noises | 1 | objections | 3 |
| Metz | 1 | mistakenly | 1 | Mountains | 1 | navigation | 2 | noisy | 1 | objects | 1 |
| Mexican | 3 | misunderstanding | 1 | mounted | 1 | navy | 4 | nominate | 1 | obliged | 1 |
| Mexico | 7 | misunderstood | 1 | mounting | 1 | Navy | 1 | nominated | 2 | O'Brien | 1 |
| Meyer | 5 | Mixer | 1 | mounts | 1 | near | 20 | nominating | 1 | obscurely | 1 |
| Miami | 1 | Mixers | 1 | mouth | 3 | nearby | 4 | nominative | 1 | obscurity | 1 |
| mice | 2 | mob | 2 | move | 3 | nearer | 1 | nomination | 8 | observation | 1 |
| Michael | 5 | mode | 1 | movement | 2 | nearing | 2 | nominations | 2 | observed | 5 |
| Michigan | 5 | models | 1 | movements | 1 | nearly | 20 | none | 7 | observers | 1 |
| Mickles | 1 | moderate | 2 | moves | 1 | neatness | 1 | non-existent | 1 | observes | 1 |
| middle | 2 | moderating | 1 | moving | 4 | necessarily | 1 | nonpartisan | 1 | obstacles | 3 |
| Middleton | 1 | modern | 6 | mower | 1 | necessary | 8 | noon | 5 | obstruct | 1 |
| Middletown | 2 | modest | 1 | much | 39 | necessitates | 1 | noose | 2 | obtain | 4 |
| mid-lake | 1 | modesty | 1 | mud | 2 | necessities | 1 | nor | 6 | obtainable | 3 |
| Midney | 1 | modestly | 1 | Mueller | 1 | neck | 3 | Nore | 1 | obtained | 10 |
| midnight | 5 | Mohamed | 3 | Mueller's | 1 | need | 3 | Nora | 1 | obtaining | 3 |
| Midsummer | 1 | Mohawk | 1 | Muir | 1 | needed | 2 | Normal | 3 | occasion | 4 |
| might | 15 | Moines | 1 | mulcting | 1 | needless | 1 | normal | 3 | occasions | 2 |
| mile | 13 | moire | 1 | Mulford | 1 | needs | 1 | north | 5 | occupants | 2 |
| Mile | 1 | Molay | 1 | multiplying | 1 | negative | 2 | Northern | 6 | occupied | 7 |
| Miles | 1 | molesting | 1 | multitude | 1 | neglect | 1 | northern | 5 | occupy | 5 |
| miles | 29 | molten | 2 | Munich | 1 | neglected | 2 | North's | 1 | occur | 2 |
| Milford | 1 | moment | 4 | municipal | 2 | negro | 2 | northwest | 1 | occurred | 3 |
| military | 6 | moments | 1 | Munfordville | 1 | neighborhood | 5 | Northwest | 1 | occurrence | 2 |
| militia | 1 | money | 24 | murder | 12 | neighbor's | 1 | northwestern | 2 | o'clock | 20 |
| milk | 1 | Money | 3 | murdered | 3 | neighbors | 6 | Norton | 1 | O'Connor | 4 |
| mill | 3 | moneyed | 1 | murderer | 6 | neither | 3 | nose | 1 | October | 4 |
| Mill | 1 | monopolistic | 1 | Murphy | 10 | nephew | 1 | nostrils | 1 | Odd | 1 |
| Miller | 13 | monotonous | 1 | Murray | 4 | net | 3 | not | 225 | odor | 1 |
| Miller's | 1 | Montague | 1 | Museum | 1 | nerves | 2 | notable | 2 | of | 2122 |
| millionaire | 1 | Monterey | 1 | museum | 1 | nervousness | 2 | notably | 1 | off | 21 |
| millionaire's | 1 | Montespan | 1 | museums | 1 | Neu | 1 | note | 1 | offenders | 1 |
| mills | 1 | Montfort | 1 | music | 1 | Neumon | 1 | noted | 3 | offense | 2 |
| Milton | 1 | Montgomery | 1 | must | 31 | neuralgia | 1 | noteworthy | 2 | offensive | 2 |
| Milwaukee | 1 | month | 12 | muster | 1 | never | 30 | nothing | 20 | offer | 2 |
| mince | 2 | monthly | 1 | mutilated | 2 | nevertheless | 2 | notice | 4 | offered | 4 |
| mind | 6 | months | 12 | muzzle | 1 | never | 30 | notice | 4 | offering | 2 |
| Minden | 2 | month's | 1 | my | 33 | new | 68 | noticed | 1 | offers | 2 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Office | 1 | origin | 1 | pal | 1 | paving | 1 | perspiration | 1 | plays | 2 |
| office | 23 | original | 3 | palace | 2 | Pay | 1 | persuade | 4 | pleaded | 1 |
| officer | 16 | originally | 1 | Palace | 1 | pay | 17 | persuaded | 1 | pleading | 1 |
| officers | 22 | originated | 2 | Palama | 1 | paying | 5 | pertaining | 1 | pleasant | 3 |
| offices | 6 | Orleans | 1 | palaver | 1 | paymaster | 1 | pet | 1 | pleasantry | 1 |
| official | 5 | ornaments | 1 | Palisard | 1 | payment | 4 | Peter | 6 | please | 2 |
| officially | 2 | orthodox | 1 | Palmer-Singer | 1 | Payn | 1 | Peters | 1 | pleased | 2 |
| officials | 8 | Orthodox | 1 | Palmera | 1 | Payne | 6 | Petersburg | 3 | pleasing | 2 |
| officiate | 1 | Orville | 5 | pamphlet | 2 | Payne-Aldrich | 1 | petition | 4 | pleasure | 4 |
| often | 5 | Osaka | 2 | Panella | 1 | pays | 1 | Petty | 1 | pledge | 3 |
| O'Hagan | 1 | Oscar | 1 | panic | 1 | peace | 1 | petrified | 8 | pledged | 1 |
| oh | 1 | Oskar | 1 | Pantown | 1 | peaches | 2 | Phelps | 2 | pledges | 2 |
| Ohio | 7 | other | 84 | papal | 3 | Pearl | 6 | Phelps' | 1 | plenty | 1 |
| Oil | 2 | others | 20 | paper | 11 | pears | 1 | Phil | 1 | plight | 1 |
| oil-soaked | 1 | otherwise | 1 | papers | 10 | Peary | 2 | Philadelphia | 15 | plot | 1 |
| Oklahoma | 3 | Ottoman | 1 | parachute | 2 | Peasant | 1 | Phillippe | 1 | Ploughman | 1 |
| O'Laughlin | 1 | ought | 3 | parade | 3 | peasants | 2 | Phillip | 2 | plumbers | 1 |
| old | 31 | our | 27 | parades | 2 | Pease | 2 | Phillips | 2 | plumes | 1 |
| olden | 1 | Our | 1 | paradise | 1 | Peck | 1 | philosopher | 1 | plums | 2 |
| older | 1 | out | 101 | paradoxical | 2 | peculiar | 1 | phonetic | 1 | plunder | 1 |
| oldest | 4 | outbreak | 1 | paradoxically | 1 | pedagogic | 1 | photographs | 1 | plunge | 1 |
| old-fashioned | 1 | outbuilding | 1 | paragraph | 1 | Peer | 1 | phrase | 1 | plunger | 1 |
| O'Leary | 1 | Outcast | 1 | paragraphs | 1 | penalty | 1 | phraseology | 1 | plurality | 1 |
| Olga | 1 | outcome | 2 | parallel | 1 | Pencil | 1 | phrenologist | 2 | plutocracy | 1 |
| Oliver | 3 | outer | 3 | paralyzing | 1 | pendency | 1 | physical | 2 | Plymouth | 5 |
| Olympian | 1 | outfits | 1 | parent | 2 | pending | 4 | physician | 1 | pockets | 2 |
| O'Malley | 3 | outgoing | 2 | parentage | 1 | penetrate | 1 | physicians | 4 | poems | 1 |
| ominous | 1 | outing | 13 | parents | 4 | penetrating | 1 | pick | 1 | Poet | 1 |
| on | 411 | outlasted | 1 | Paris | 9 | penetration | 1 | picked | 1 | point | 9 |
| once | 16 | outline | 3 | Park | 1 | penitentiary | 1 | picnic | 1 | Point | 3 |
| one | 116 | outruns | 1 | park | 3 | penned | 1 | picture | 7 | pointed | 8 |
| one's | 2 | outside | 9 | Parkersburg | 1 | Penrose | 1 | pictured | 1 | Pointer | 12 |
| only | 58 | over | 72 | Parliament | 1 | Pennsylvania | 7 | pictures | 1 | points | 2 |
| Ontario | 2 | overcome | 1 | parliamentary | 2 | people | 44 | piece | 1 | poise | 1 |
| onward | 1 | overcoming | 1 | parliaments | 3 | People | 1 | pieces | 2 | polar | 3 |
| open | 21 | overdone | 1 | parlors | 2 | peoples | 1 | Pierre | 1 | pole | 4 |
| opened | 5 | overland | 2 | partially | 2 | per | 11 | pies | 1 | police | 15 |
| opening | 10 | overpowered | 1 | particular | 6 | percentage | 2 | Pike | 1 | Police | 3 |
| opens | 3 | Overseer | 1 | particularly | 2 | perceptibly | 1 | pile | 1 | policeman | 1 |
| operatic | 1 | oversees | 3 | particulars | 2 | Percy | 1 | piled | 2 | policemen | 1 |
| operating | 7 | overtaxed | 1 | part | 27 | perennially | 1 | piloting | 1 | Policia | 1 |
| operation | 8 | overthrow | 1 | parties | 2 | perfect | 6 | pin | 1 | policies | 1 |
| operations | 4 | overtook | 1 | partly | 1 | perfected | 2 | pink | 1 | policy | 1 |
| opinion | 16 | Overture | 2 | partner | 1 | perfection | 1 | Pioneer | 1 | polish | 1 |
| opinions | 3 | overwhelmingly | 1 | parts | 3 | perfectly | 1 | pipe | 1 | polished | 1 |
| Oppenheim | 1 | overworked | 2 | party | 40 | perforated | 1 | pistil | 2 | polishing | 2 |
| opponent | 2 | owed | 1 | pass | 6 | perform | 1 | pistils | 1 | political | 19 |
| opponents | 2 | Owens | 4 | passage | 2 | performance | 2 | pitched | 1 | politicians | 2 |
| opportune | 1 | owing | 6 | passed | 11 | performed | 1 | Pittsburg | 7 | politics | 12 |
| opportunity | 4 | own | 22 | passenger | 4 | performer | 1 | pity | 3 | Politics | 1 |
| opposed | 2 | Own | 1 | Passenger | 1 | perhaps | 8 | place | 34 | pollon | 3 |
| opposing | 2 | owned | 4 | passengers | 1 | perilous | 1 | placed | 16 | polls | 2 |
| opposite | 1 | owner | 7 | passes | 2 | period | 8 | places | 3 | polluting | 1 |
| opposition | 4 | owner's | 1 | passing | 3 | periods | 2 | placing | 3 | Polytechnic | 1 |
| oppressed | 1 | owners | 9 | past | 10 | Perkins | 1 | plain | 3 | pompons | 1 |
| or | 125 | ownership | 1 | pastor | 4 | permanent | 3 | Plains | 1 | pool | 1 |
| orb | 1 | owns | 2 | patent | 1 | permanently | 1 | plan | 9 | poor | 4 |
| orchard | 1 | oxidizes | 1 | pathetic | 1 | permeate | 1 | Planches | 2 | poorer | 1 |
| orchids | 1 | oxygen | 1 | patients | 1 | permission | 2 | planet | 1 | poorest | 1 |
| order | 37 | | | Patrick | 3 | permit | 3 | plank | 1 | poorly | 1 |
| ordered | 7 | Pacific | 3 | Patrick's | 1 | permits | 1 | planned | 2 | Pope | 1 |
| ordering | 1 | pack | 1 | patriot | 2 | permitted | 2 | planning | 2 | populace | 1 |
| orderlies | 1 | packed | 1 | patriotic | 5 | permitting | 1 | plans | 7 | Popular | 1 |
| orders | 9 | packets | 1 | patriotism | 1 | perpetuate | 1 | plant | 10 | popular | 10 |
| ordinances | 1 | Paderewski | 1 | Patrolman | 5 | Perryville | 1 | plants | 1 | popularity | 1 |
| ordinary | 3 | Page | 3 | Patterson | 1 | persisted | 1 | plaster | 1 | population | 9 |
| Oregon | 1 | page | 14 | Paul | 7 | persistently | 1 | plateau | 1 | pork | 1 |
| organization | 8 | pageant | 3 | Paul's | 1 | persists | 1 | platform | 7 | port | 2 |
| organizations | 1 | paid | 9 | paused | 1 | person | 8 | plausible | 1 | porter | 1 |
| organize | 1 | pains | 1 | paved | 1 | personal | 6 | play | 5 | Porter | 6 |
| organized | 8 | painters | 1 | pavement | 8 | personality | 2 | played | 3 | portfolio | 1 |
| organs | 1 | paints | 1 | pavements | 1 | personally | 2 | playground | 2 | Portland | 1 |
| Oriental | 1 | pair | 1 | pavilions | 1 | persons | 13 | playing | 1 | portion | 5 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Porto | 1 | Premier | 1 | privileges | 2 | prostrate | 1 | Quad | 1 | Raymond | 1 |
| portrays | 1 | premier | 1 | prizes | 2 | protect | 2 | qualified | 2 | rays | - |
| ports | 2 | premium | 2 | probability | 2 | protected | 1 | qualifies | 1 | reach | 5 |
| Portugal | 1 | preparation | 1 | probable | 4 | protection | 1 | quality | 2 | reached | 15 |
| poses | 1 | preparations | 3 | probably | 5 | protectionist | 1 | quantities | 1 | reaching | 1 |
| posing | 1 | prepared | 10 | probate | 2 | protective | 1 | quantity | 1 | read | 7 |
| position | 7 | prepares | 1 | probation | 1 | protested | 1 | quarrel | 1 | readily | 1 |
| positions | 6 | preparing | 2 | problem | 6 | protests | 1 | quarter | 2 | reading | 2 |
| positive | 2 | Presbyterian | 1 | proceed | 4 | prothonotary | 1 | quarters | 4 | ready | 15 |
| possess | 1 | presence | 3 | proceeding | 13 | protuberances | 1 | quarts | 1 | real | 3 |
| possessed | 1 | present | 30 | proceedings | 1 | proud | 3 | Quebec | 1 | realization | 1 |
| possession | 1 | presentation | 5 | proceeds | 3 | prove | 9 | queen | 1 | really | 7 |
| possessor | 1 | presented | 5 | process | 2 | proved | 6 | Queen | 2 | realms | 1 |
| possibilities | 1 | presently | 1 | proclamation | 1 | proves | 3 | Queens | 1 | realty | 2 |
| possibility | 2 | presents | 1 | procuring | 1 | provide | 2 | query | 1 | reaping | 1 |
| possible | 23 | preservation | 2 | produce | 2 | provided | 7 | question | 22 | rear | 2 |
| possibly | 2 | preserve | 1 | produced | 3 | provides | 2 | Question | 1 | rearrangement | 1 |
| post | 4 | preserves | 1 | producing | 1 | Providence | 3 | questioning | 1 | reason | 12 |
| Post | 4 | presided | 1 | product | 1 | providing | 1 | questions | 2 | reasonably | 1 |
| post-office | 3 | presidency | 2 | production | 1 | Provincetown | 2 | quick | 2 | reasons | 3 |
| postponed | 4 | president | 3 | products | 2 | provision | 10 | quickly | 4 | reasserts | 1 |
| postponement | 1 | President | 16 | profession | 1 | provisions | 5 | quickness | 1 | rebel | 1 |
| postscript | 1 | presidential | 1 | professional | 2 | prunes | 1 | quiet | 6 | rebuffs | 1 |
| potatoes | 1 | Press | 2 | professor | 1 | Prussia | 1 | Quinn | 2 | rebuilding | 3 |
| potentate | 1 | press | 21 | Professor | 3 | Prussian | 1 | quit | 1 | rebuilt | 1 |
| Potomac | 2 | pressing | 2 | professors | 1 | Public | 1 | quite | 9 | recall | 2 |
| poultry | 2 | pressure | 5 | proficiency | 1 | public | 25 | quote | 3 | receipt | 1 |
| pound | 1 | Preston | 1 | profits | 1 | publication | 8 | quoted | 2 | receive | 6 |
| pounds | 8 | presumed | 1 | profound | 1 | publicists | 1 | quotes | 1 | received | 20 |
| pour | 1 | presuming | 1 | program | 4 | publicly | 1 |  |  | receives | 1 |
| poured | 1 | presumption | 1 | Progresome | 1 | published | 7 | rabid | 3 | receiving | 3 |
| pouring | 1 | pretends | 1 | progress | 11 | publishers | 2 | race | 5 | recent | 9 |
| poverty | 4 | pretenses | 1 | prohibition | 2 | publishes | 2 | raced | 1 | recently | 13 |
| powder | 1 | prettily | 1 | prohibitory | 3 | publishing | 1 | races | 4 | reception | 1 |
| power | 5 | pretty | 6 | prohibits | 1 | pulled | 3 | racing | 4 | receptions | 1 |
| powerboat | 1 | prevailed | 4 | project | 1 | Pulliam | 1 | radical | 3 | recess | 1 |
| powerful | 4 | prevailing | 1 | prolonged | 1 | pulpit | 2 | radicals | 1 | reckoned | 1 |
| powerless | 1 | prevent | 4 | promenaders | 1 | pumped | 2 | rafter | 1 | recognition | 2 |
| powers | 1 | prevented | 1 | prominence | 1 | pumping | 1 | rags | 1 | recognized | 1 |
| practical | 1 | preventive | 1 | prominent | 4 | pumpkins | 1 | raids | 1 | recommended | 2 |
| practically | 9 | prevents | 1 | prominently | 1 | pumps | 1 | Railroad | 2 | recommendation | 2 |
| practice | 1 | previous | 3 | promise | 1 | punish | 1 | railroad | 7 | recommendations | 2 |
| practiced | 1 | previously | 1 | promised | 7 | punished | 3 | railroads | 3 | recommends | 1 |
| prairie | 1 | price | 7 | promises | 2 | punishing | 1 | rails | 1 | recommit | 2 |
| prairies | 1 | priceless | 1 | promising | 1 | punishment | 2 | railway | 3 | reconciled | 1 |
| praise | 3 | prices | 8 | promoted | 1 | pupils | 1 | rain | 1 | reconstituted | 1 |
| praised | 1 | pride | 3 | promotion | 2 | purchase | 1 | Raines | 1 | reconstructing | 1 |
| Prayer | 1 | Pries | 2 | promotor | 1 | purchased | 2 | Rainier | 1 | record | 2 |
| prayer | 1 | prima | 1 | prompted | 1 | purchases | 1 | rains | 1 | recorded | 2 |
| preach | 3 | primaries | 2 | promptly | 1 | purchasing | 2 | raised | 7 | record-breaking | 1 |
| preached | 1 | primary | 19 | pronounced | 6 | purely | 1 | raises | 1 | Record-Herald | 1 |
| preacher | 1 | prime | 1 | pronunciation | 4 | purest | 1 | raising | 1 | records | 3 |
| preachers | 2 | prince | 3 | proof | 3 | purge | 1 | Ralph | 1 | recoup | 1 |
| precaution | 2 | Prince | 6 | proper | 6 | purify | 1 | ramifications | 1 | recover | 4 |
| precautions | 1 | Princess | 7 | properly | 4 | puritanic | 1 | ran | 4 | recovered | 5 |
| precedents | 2 | princess's | 1 | properties | 1 | purity | 1 | rang | 1 | recovery | 3 |
| precious | 2 | princesses | 1 | property | 8 | purloined | 1 | range | 1 | Recreation | 1 |
| precipice | 1 | principal | 7 | prophecy | 1 | purpose | 6 | ranged | 1 | Recreations | 1 |
| precipitated | 1 | principals | 2 | prophesying | 1 | purposes | 4 | Rangeley | 1 | recruits | 2 |
| precisely | 1 | principalship | 2 | proportion | 1 | purses | 1 | ranges | 1 | red | 1 |
| precision | 1 | principle | 1 | proposal | 3 | pursue | 2 | rank | 6 | Red | 3 |
| predecessor | 1 | principles | 1 | proposals | 1 | pursued | 1 | ranked | 1 | redeemed | 1 |
| predecessors | 1 | print | 1 | proposed | 5 | pursuing | 5 | ranks | 1 | reduced | 5 |
| predict | 1 | printed | 1 | proposition | 13 | pursuit | 1 | rapid | 4 | reduction | 2 |
| predicted | 4 | printers | 1 | propositions | 1 | Purtell | 2 | rapidly | 4 | reductions | 1 |
| prediction | 1 | printing | 1 | proprietor | 3 | Purvis | 4 | rapidity | 1 | reefs | 1 |
| preference | 2 | Prison | 1 | prose | 1 | put | 27 | Rapids | 2 | reelection | 1 |
| preferment | 1 | prison | 5 | prosecution | 1 | Putnam | 1 | rare | 2 | reenter | 1 |
| preferred | 1 | prisoner | 3 | prosecutions | 1 | putting | 2 | rarely | 1 | refer | 2 |
| prelate | 1 | prisoner's | 1 | prospect | 2 | puts | 1 | rate | 9 | referee | 1 |
| preliminary | 7 | prisoners | 4 | prospects | 2 | puzzle | 1 | rates | 3 | reference | 1 |
| preliminaries | 1 | private | 7 | prospective | 1 | puzzled | 1 | rather | 5 | referred | 5 |
| premeditative | 1 | privilege | 3 | prosperous | 1 |  |  | ratify | 1 | referring | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| reflect | 1 | rendered | 1 | restraint | 2 | Road | 4 | ruins | 1 | saving | 2 |
| reflection | 1 | rendezvous | 1 | result | 16 | road | 14 | rule | 11 | saw | 14 |
| reform | 1 | renewed | 1 | resulted | 4 | roads | 8 | ruler | 1 | Sawyer | 1 |
| reforming | 1 | Renselaer | 1 | resulting | 1 | roadside | 1 | rules | 2 | Sawyer's | 1 |
| refuse | 2 | reopen | 1 | results | 5 | roadstead | 1 | rumored | 1 | Saxe-Coburg | 1 |
| refused | 3 | reorganization | 2 | resurrection | 1 | roadway | 1 | rumors | 2 | say | 26 |
| refuses | 1 | repair | 5 | retain | 2 | Roam | 1 | run | 14 | saying | 3 |
| refusing | 4 | repaired | 1 | retained | 2 | roar | 1 | runabout | 1 | Saykes | 2 |
| regain | 2 | repairing | 4 | retired | 7 | rob | 1 | runaround | 1 | Saylor | 3 |
| regaining | 1 | repairs | 1 | retirement | 2 | robbed | 3 | running | 14 | says | 42 |
| Regan | 4 | repeats | 1 | retried | 1 | robbery | 3 | Rupp | 1 | scale | 1 |
| regard | 6 | repetition | 1 | return | 14 | Robert | 6 | rurales | 2 | scalpers | 2 |
| regarded | 2 | Rettershof | 1 | returned | 16 | Roberts | 1 | rushed | 3 | scanty | 1 |
| regarding | 5 | replace | 2 | returning | 5 | Robertson | 5 | rushes | 1 | scared | 1 |
| regards | 1 | replaced | 2 | returns | 5 | Robinson | 4 | rushing | 2 | scares | 1 |
| regime | 1 | replenishing | 1 | Reuben | 2 | Rochester | 7 | Russia | 2 | scarf | 1 |
| regiment | 1 | replied | 3 | revealed | 2 | Rochevot | 2 | Russian | 12 | scatter | 1 |
| regiments | 1 | reply | 1 | revel | 1 | Rock | 2 | Ruth | 1 | scattered | 1 |
| Regina | 1 | report | 11 | reverend | 2 | rock | 2 | | | scene | 5 |
| region | 3 | reported | 9 | reverse | 2 | rocks | 4 | sachem | 2 | scenes | 5 |
| regions | 5 | reporter | 3 | reversed | 1 | rode | 1 | Sackett | 3 | scenic | 1 |
| Regis | 1 | reports | 7 | revert | 1 | Roebung | 1 | Sackett's | 2 | scepter | 1 |
| register | 2 | represent | 5 | Reves | 1 | Rogan's | 1 | sacque | 1 | scepticism | 1 |
| registration | 3 | representations | 1 | reviewed | 1 | Rogenthien | 4 | Sacramento | 1 | schedule | 3 |
| regret | 1 | representative | 3 | revival | 2 | Rogues | 1 | sacred | 3 | scheduled | 2 |
| regrets | 2 | representatives | 3 | revision | 2 | roll | 1 | sacrifice | 2 | schedules | 1 |
| regular | 5 | represented | 1 | revolt | 3 | rolled | 2 | sad | 2 | scheme | 3 |
| regularity | 1 | representing | 5 | revolutionaries | 1 | roller | 1 | saddle | 1 | schemer | 1 |
| regularly | 2 | represents | 5 | revolver | 4 | Roman | 1 | safe | 5 | Scheu | 1 |
| regulars | 1 | repression | 1 | Reyburn | 2 | romance | 2 | safeguard | 1 | Schmeiding | 1 |
| Reichtag | 1 | Republic | 1 | Rhode | 2 | romancers | 1 | Sahara | 3 | Schmidt | 2 |
| Reichtag's | 1 | Republican | 7 | rhymes | 1 | Rome | 2 | said | 68 | Schnitzler | 1 |
| reign | 1 | Republicans | 6 | ribbon | 2 | roof | 1 | sail | 1 | Schneider | 1 |
| reigned | 1 | reputable | 1 | ribbons | 1 | roofer | 2 | sailed | 3 | Schoenhut | 1 |
| Reimann | 2 | reputation | 1 | rich | 5 | room | 12 | sailing | 5 | scholar | 1 |
| reindeer | 1 | reputed | 1 | Richard | 2 | roomed | 1 | sails | 1 | School | 1 |
| reiterate | 1 | request | 4 | Richardson | 1 | rooms | 3 | Saint | 7 | school | 13 |
| reject | 1 | requested | 2 | Richness | 1 | Roosevelt | 6 | sake | 1 | schooling | 1 |
| rejected | 1 | require | 1 | rid | 1 | Root | 2 | salaried | 1 | schools | 8 |
| relate | 1 | required | 4 | ridden | 2 | Root's | 1 | salaries | 13 | Science | 1 |
| relation | 1 | requirements | 1 | Ridder | 4 | rope | 2 | salary | 4 | Scientific | 2 |
| relations | 3 | requisition | 1 | Ridder's | 1 | rose | 1 | sale | 5 | scientists | 2 |
| relationship | 1 | rescue | 4 | Ridge | 1 | Roseville | 1 | sales | 2 | Scinta's | 1 |
| relatives | 1 | rescued | 1 | Ridgway | 1 | Rossow | 1 | salient | 1 | scion | 1 |
| relay | 3 | research | 1 | ridiculous | 1 | Rostand | 1 | Salma | 1 | scoffed | 1 |
| released | 4 | resided | 1 | riding | 3 | Roswell | 1 | saloon | 1 | score | 4 |
| reliable | 1 | residence | 5 | rig | 1 | Rothschild | 2 | Salt | 1 | scores | 2 |
| reliability | 2 | resident | 3 | right | 11 | Rothschild's | 1 | salt | 1 | Scotch | 1 |
| relief | 7 | residents | 3 | Right | 1 | rough | 1 | salubrious | 1 | Scotland | 1 |
| relieve | 3 | resides | 1 | rights | 1 | Roumania | 1 | salvation | 1 | Scots | 1 |
| relieved | 2 | resigned | 1 | rigor | 1 | Roumanian | 1 | Sam | 4 | Scotsmen | 2 |
| religious | 1 | resistance | 2 | rigorous | 1 | round | 6 | same | 32 | scrap | 1 |
| reluctance | 1 | resisting | 1 | Rigs | 1 | rounds | 1 | Sams | 5 | scraped | 1 |
| relying | 2 | resolutions | 2 | Riley | 4 | Rourke | 1 | Samuel | 6 | scratch | 1 |
| remain | 5 | resort | 5 | Rillis | 1 | rout | 1 | San | 4 | scratched | 1 |
| remainder | 3 | resources | 5 | ringing | 1 | route | 4 | sanction | 1 | scrawled | 1 |
| remained | 4 | respect | 2 | rink | 1 | routed | 1 | sanctioned | 1 | screams | 1 |
| remaining | 2 | respectively | 1 | riots | 1 | routine | 3 | sand | 1 | screens | 1 |
| remains | 4 | respite | 1 | ripe | 2 | row | 1 | sanitary | 1 | screws | 1 |
| remark | 1 | respond | 1 | ripen | 1 | Rowan | 1 | sanitation | 1 | scrub | 1 |
| remarkable | 5 | responded | 1 | rise | 2 | Rowland | 1 | sanity | 2 | scrubbed | 1 |
| remarked | 1 | response | 2 | rises | 2 | royal | 8 | sank | 4 | scruple | 1 |
| remedies | 1 | responsible | 8 | rising | 1 | royalty | 1 | Saratoga | 2 | scurrilous | 1 |
| remedy | 3 | rest | 10 | risking | 1 | Rozan | 1 | Sardarad | 1 | scrutinizing | 3 |
| remember | 2 | restaurant | 2 | rite | 1 | rubber | 4 | sat | 2 | Sea | 1 |
| remembered | 3 | rested | 1 | Rite | 1 | Rublee | 2 | satire | 1 | sea | 7 |
| Reminiscences | 1 | restless | 1 | rites | 2 | Rublee's | 1 | satisfaction | 1 | seacoast | 1 |
| Remington | 1 | restoration | 3 | river | 10 | Rudolph | 1 | satisfactory | 4 | sealskin | 2 |
| removal | 4 | restore | 1 | River | 12 | Ruffles | 1 | satisfied | 6 | Seaman's | 1 |
| remove | 3 | restored | 4 | Riviera | 1 | Rufus | 1 | Saturday | 3 | seamstress | 4 |
| removed | 2 | restoring | 1 | Riverside | 4 | ruin | 3 | Savants | 1 | seance | 3 |
| removing | 1 | restrain | 1 | | | ruined | 1 | save | 6 | search | 5 |
| render | 1 | restrained | 5 | | | ruining | 1 | saved | 3 | searchers | 1 |
| | | restraining | 3 | | | | | | | | |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| searching | 3 | Senussi | 1 | shoot | 1 | Siwa | 1 | something | 13 | spite | 2 |
| seas | 5 | separate | 2 | shooting | 1 | Sixth | 1 | sometimes | 5 | splendid | 5 |
| sea's | 1 | separating | 1 | shop | 1 | size | 3 | somewhat | 6 | splinters | 1 |
| seaside | 2 | September | 5 | shops | 1 | sizes | 3 | son | 11 | split | 1 |
| season | 5 | sergeant | 1 | shore | 6 | sketch | 2 | song | 2 | spoil | 1 |
| seasonable | 1 | Sergeant | 2 | short | 15 | skilfully | 2 | son-in-law | 2 | spoke | 1 |
| season's | 1 | serial | 1 | shorten | 1 | skin | 1 | sonorous | 1 | spoken | 2 |
| seat | 2 | series | 5 | shorter | 1 | skirt | 1 | sons | 2 | sponsoring | 1 |
| Seattle | 2 | serious | 10 | shortly | 8 | skull | 4 | soon | 21 | spontaneous | 1 |
| Sebastian | 1 | seriously | 8 | shortness | 1 | sky | 1 | Sophia | 2 | Spoeri | 1 |
| second | 8 | seriousness | 1 | shorts | 1 | slacken | 1 | Sornberger | 4 | spoerr | 1 |
| seconds | 1 | sermons | 1 | shot | 8 | slammed | 1 | Sorrow | 1 | sport | 2 |
| secret | 4 | servant | 1 | should | 28 | slated | 1 | sorry | 2 | Sport | 1 |
| secretaries | 1 | serve | 4 | shoulders | 2 | Slater | 2 | sort | 2 | sports | 2 |
| secretary | 9 | served | 8 | shouting | 1 | slavery | 3 | sorts | 1 | spot | 5 |
| Secretary | 1 | serves | 1 | shoved | 1 | sledge | 1 | sought | 2 | spots | 1 |
| secretly | 1 | Servia | 2 | show | 19 | sledges | 2 | sound | 3 | spouse | 1 |
| section | 10 | service | 12 | showed | 2 | sleep | 2 | sounded | 1 | sprang | 1 |
| sectional | 2 | services | 3 | shower | 1 | sleeping | 1 | sources | 1 | spread | 1 |
| sections | 2 | serving | 3 | showered | 1 | sleeve | 1 | south | 7 | spring | 3 |
| secure | 3 | session | 11 | showers | 1 | slender | 1 | South | 5 | Spring | 1 |
| secured | 2 | sessions | 6 | showing | 1 | slept | 1 | Southall | 2 | springs | 2 |
| securing | 2 | set | 10 | shown | 5 | Slicks | 1 | Southampton | 2 | sprouting | 1 |
| securely | 1 | sets | 1 | shows | 11 | slight | 2 | southbound | 1 | sprung | 1 |
| security | 1 | setting | 1 | Shroeder | 2 | slightest | 1 | southeastern | 1 | squad | 1 |
| see | 16 | settings | 1 | shut | 1 | slightly | 2 | southern | 3 | squadron | 2 |
| seed | 1 | settle | 1 | shy | 1 | sling | 1 | Southern | 6 | squads | 1 |
| seeds | 1 | settled | 5 | sick | 1 | slipped | 3 | Southery | 1 | squarely | 1 |
| Seefried | 1 | settlement | 1 | side | 19 | sliver | 1 | southlands | 1 | squelched | 1 |
| seeing | 3 | several | 26 | sides | 5 | Slocum's | 1 | southwest | 1 | stabbed | 1 |
| seek | 5 | severe | 6 | sidewalk | 1 | small | 8 | Southwick | 1 | staff | 4 |
| seekers | 1 | severely | 1 | sight | 7 | smaller | 2 | sovereign | 1 | stag | 1 |
| seeks | 2 | sex | 3 | sign | 2 | smashed | 1 | space | 1 | stage | 2 |
| seem | 3 | sexton | 1 | signal | 2 | smelled | 2 | Spain | 3 | stagger | 1 |
| Seeman | 1 | sexual | 1 | signally | 1 | smells | 1 | Spangled | 1 | stake | 1 |
| seemed | 7 | Seymour | 1 | signals | 1 | smiled | 2 | Spanish | 6 | stakes | 1 |
| seems | 14 | Shaefer | 1 | signatures | 1 | smiles | 1 | spans | 1 | stalwart | 1 |
| seen | 9 | shaft | 1 | signed | 5 | smoke | 2 | spared | 1 | Stamboul | 1 |
| sees | 1 | shafts | 1 | significance | 1 | smoothed | 1 | sparks | 1 | stamen | 1 |
| seesaw | 1 | shaken | 1 | signing | 1 | smoothly | 1 | speak | 2 | stammer | 1 |
| Seibert | 8 | shakes | 1 | signs | 2 | smuggle | 1 | Speaker | 1 | Stanch | 1 |
| Seibert's | 2 | Shakespeare | 2 | silence | 2 | smuggled | 3 | speakers | 1 | stand | 8 |
| seize | 2 | Shakespeare's | 1 | silk | 2 | Smyrna | 1 | speaking | 5 | standard | 2 |
| seldom | 1 | shall | 15 | silted | 1 | sneak | 2 | spears | 1 | Standard | 3 |
| selected | 6 | shame | 3 | silver | 3 | Snell | 5 | special | 33 | Standart | 1 |
| Selection | 2 | shape | 1 | similar | 6 | snow | 2 | specially | 1 | standing | 4 |
| selection | 1 | shaped | 1 | similarity | 1 | snowsheds | 1 | specialty | 1 | Standford | 1 |
| self | 3 | share | 3 | simple | 1 | snuffed | 1 | specifically | 1 | Stanley | 1 |
| sell | 5 | shared | 1 | simply | 5 | snug | 1 | specimen | 1 | standpatism | 1 |
| semblance | 1 | sharp | 1 | simultaneous | 3 | so | 67 | specimens | 1 | stands | 2 |
| semiofficial | 1 | Shaw | 2 | simultaneously | 2 | social | 2 | spectacular | 1 | staples | 1 |
| semiofficially | 1 | she | 133 | since | 35 | socialism | 2 | spectators | 1 | Star | 4 |
| senate | 20 | shed | 7 | sincerely | 1 | socialists | 1 | speculation | 1 | Stark | 2 |
| Senate | 9 | shekels | 1 | sincerity | 1 | Socialists | 1 | sped | 2 | stars | 1 |
| Senator | 18 | shelter | 1 | sing | 1 | societies | 2 | speech | 3 | start | 5 |
| senator | 3 | shelters | 1 | Sing | 3 | society | 5 | speeches | 3 | started | 9 |
| Senators | 3 | Sheapard | 1 | singer | 1 | Sociologist | 1 | speed | 2 | starting | 4 |
| senators | 4 | Shepherd | 1 | single | 5 | soft | 2 | speedy | 2 | startled | 1 |
| send | 2 | Sheriff | 2 | Sioux | 2 | softness | 1 | spell | 1 | starts | 3 |
| sending | 3 | sheriff | 1 | Siparder | 1 | sold | 12 | spelling | 1 | starvation | 2 |
| Seneca | 13 | Sherman | 2 | Sir | 3 | soldiers | 2 | spend | 3 | starving | 1 |
| senior | 2 | shine | 1 | Sisson | 1 | sole | 1 | spending | 1 | State | 10 |
| Senor | 1 | ship | 13 | sister | 6 | solely | 2 | spends | 3 | state | 28 |
| sensation | 3 | Shipp | 1 | sister-in-law | 1 | solemn | 1 | Spenser | 2 | stated | 10 |
| sensational | 5 | shipped | 1 | sisters | 1 | solemnly | 1 | spent | 7 | statement | 18 |
| sense | 5 | ships | 7 | sister's | 1 | Solent | 1 | spinal | 1 | statements | 5 |
| senseless | 1 | Shively | 1 | Sistersville | 1 | soliciting | 2 | spindle | 1 | states | 9 |
| sensible | 2 | shiver | 1 | sit | 1 | Solomon | 1 | spine | 1 | States | 18 |
| sent | 17 | shock | 2 | site | 4 | solution | 1 | spirited | 1 | statesmen | 3 |
| sentence | 3 | shocked | 1 | sits | 2 | solve | 2 | spirits | 5 | stating | 1 |
| sentenced | 2 | shocks | 1 | sitting | 3 | some | 85 | spiritualism | 2 | station | 10 |
| sentiment | 3 | Shoe | 1 | situated | 2 | somebody | 1 | spiritualist | 2 | stationed | 3 |
| sentimental | 1 | shook | 1 | situation | 4 | someone | 2 | spiritualistic | 4 | stations | 11 |

61

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| statistics | 3 | streams | 2 | suffered | 6 | Sutton | 1 | taxicab | 2 | therefrom | 1 |
| Statuary | 1 | street | 42 | suffering | 3 | Swan | 5 | tax-payers | 6 | thereof | 1 |
| statues | 2 | streets | 17 | sufficed | 1 | swears | 1 | Taylor | 7 | thereon | 2 |
| statute | 4 | strength | 1 | sufficient | 5 | sweat | 1 | tea | 1 | these | 50 |
| stay | 9 | strengthen | 1 | sufficiently | 1 | Sweden | 1 | teacher | 2 | they | 161 |
| staying | 2 | strengthened | 1 | suffrage | 3 | Sweeny | 3 | teachers | 1 | thick | 2 |
| stealing | 3 | strenuous | 1 | suggested | 6 | sweep | 1 | teaching | 2 | thief | 1 |
| steals | 1 | stretch | 3 | suggestion | 2 | sweeping | 2 | team | 3 | thieves | 1 |
| steam | 2 | strewn | 1 | suggestions | 3 | sweeps | 1 | tearing | 1 | thin | 2 |
| steamer | 9 | stricken | 2 | suicide | 7 | sweet | 2 | tedious | 1 | thing | 11 |
| steamers | 4 | strictness | 3 | suit | 4 | Sweet | 1 | teeth | 6 | things | 11 |
| steamship | 1 | strife | 1 | suitable | 1 | swept | 2 | Teheran | 1 | think | 9 |
| Stearath | 1 | strike | 2 | suits | 4 | swift | 1 | Telegraph | 1 | thinking | 2 |
| Stearns | 1 | Striker | 2 | Sullivan | 3 | swimmer | 1 | telephone | 2 | thinks | 5 |
| steel | 2 | strikes | 1 | Sultan | 1 | swimmers | 1 | tell | 7 | thinnest | 1 |
| steering | 1 | striking | 3 | sum | 1 | swimming | 6 | telling | 1 | Third | 2 |
| Steger | 1 | strikingly | 1 | summer | 10 | Swinburne | 1 | tells | 5 | thirsty | 1 |
| Stella | 1 | string | 1 | Summers | 1 | swindled | 1 | temperamental | 1 | this | 217 |
| stench | 1 | stripped | 1 | summary | 1 | swing | 2 | temperate | 1 | Thoburn | 1 |
| Stengel | 1 | striving | 1 | summoned | 5 | swinging | 2 | temperature | 2 | Thomas | 9 |
| stenographers | 1 | stroke | 1 | summoning | 1 | switch | 1 | temperatures | 1 | thorough | 2 |
| Stephenson | 1 | strong | 6 | summons | 3 | switches | 1 | Tempest | 1 | thoroughly | 2 |
| stepped | 4 | Strong | 6 | sumptuously | 1 | switching | 1 | temple | 2 | those | 25 |
| stepping | 1 | stronger | 1 | sums | 2 | Switzerland | 1 | temporary | 6 | though | 20 |
| steps | 6 | strongest | 1 | sun | 5 | sword | 2 | tempting | 1 | thought | 5 |
| Sterling | 1 | stronghold | 1 | Sun | 6 | swung | 1 | tendencies | 1 | thoughtful | 1 |
| stern | 1 | Strong's | 2 | Sunday | 23 | sympathies | 1 | tendency | 4 | thoughtfulness | 1 |
| Steul | 6 | struck | 11 | sunk | 2 | sympathize | 2 | tending | 1 | thoughtless | 1 |
| Steul's | 2 | structure | 3 | sunken | 2 | sympathizers | 1 | tends | 1 | thoughts | 1 |
| stick | 1 | structures | 1 | sunny | 1 | sympathy | 2 | Tener | 3 | threat | 2 |
| stiff | 1 | struggle | 1 | superintendent | 4 | symptom | 1 | Tenjost | 1 | threatened | 2 |
| stiffen | 1 | Stuart | 3 | superintendents | 1 | Syndicate | 1 | Tennessee | 2 | threatens | 2 |
| still | 14 | stubbornly | 1 | superior | 5 | Syracuse | 2 | Tennyson | 1 | threats | 1 |
| Stiles | 5 | student | 3 | Superior | 1 | system | 26 | tenor | 2 | threshed | 1 |
| Stilliman | 1 | students | 1 | Suppe | 1 | systematization | 1 | tent | 4 | threshing | 1 |
| stir | 2 | study | 2 | supplanted | 1 | systems | 2 | tentative | 1 | threw | 1 |
| stitch | 1 | studying | 2 | supplies | 2 | | | tents | 2 | thrifty | 1 |
| stock | 3 | stuff | 2 | supply | 9 | tableaux | 3 | tercentenary | 1 | thrilling | 1 |
| Stoddard | 1 | stump | 1 | support | 7 | Tacoma | 1 | term | 2 | throat | 2 |
| stole | 3 | stunned | 1 | supporters | 1 | tact | 1 | termed | 1 | throngs | 1 |
| stolen | 6 | stunt | 1 | supposed | 8 | Taft | 5 | terms | 10 | through | 44 |
| stomach | 2 | sturdy | 1 | supposing | 1 | Taft's | 1 | Terre | 3 | throughout | 6 |
| stone | 9 | style | 1 | suppressed | 2 | tag | 3 | terrible | 6 | throw | 3 |
| Stone | 1 | stylishly | 1 | supremacy | 1 | tail | 2 | territory | 3 | throwing | 1 |
| stones | 4 | subject | 14 | Supreme | 2 | tailored | 1 | test | 3 | thrown | 8 |
| stood | 8 | subjected | 1 | sure | 2 | tailors | 1 | testator's | 1 | throws | 1 |
| stop | 8 | subjects | 1 | surely | 2 | tails | 1 | testified | 1 | thud | 1 |
| stopped | 7 | submerged | 1 | surface | 2 | take | 35 | testimony | 7 | thumbnail | 1 |
| stopping | 1 | submitted | 3 | surgeons | 3 | taken | 29 | testing | 1 | thunder | 2 |
| stops | 2 | subscribers | 1 | surging | 1 | takes | 8 | Teuton | 1 | Thunder | 1 |
| store | 5 | subscription | 1 | surmise | 1 | taking | 15 | Texan | 1 | thunderless | 1 |
| stores | 1 | subscriptions | 1 | surpassing | 1 | tale | 2 | Texas | 4 | thunderstorms | 1 |
| stories | 6 | subsequently | 1 | surprise | 5 | talk | 4 | text | 2 | Thursday | 9 |
| stork | 1 | subsidy | 2 | surprised | 2 | talked | 6 | Thames | 2 | thus | 3 |
| stormed | 1 | subsidize | 1 | surprises | 1 | talking | 3 | than | 71 | ticket | 6 |
| storms | 2 | subsistence | 1 | surprising | 1 | talks | 6 | that | 591 | tickets | 4 |
| story | 22 | substance | 2 | surrounded | 2 | tall | 1 | Thaw | 2 | tie | 1 |
| Story | 1 | substantiates | 1 | surrendered | 1 | Tammany | 2 | the | 4290 | tied | 1 |
| stove | 1 | subterranean | 1 | surrounding | 1 | tank | 1 | theater | 2 | ties | 1 |
| straight | 2 | Suburban | 1 | surroundings | 1 | tap | 1 | theaters | 7 | Tifft | 2 |
| straightened | 1 | suburbs | 2 | susceptible | 2 | taps | 1 | theft | 2 | tight | 1 |
| strain | 1 | succeed | 6 | suspected | 2 | tariff | 12 | their | 112 | tightened | 1 |
| strained | 1 | succeeding | 2 | suspended | 2 | task | 4 | them | 56 | tiled | 1 |
| stranded | 1 | succeeds | 1 | suspending | 1 | taste | 3 | themes | 1 | till | 1 |
| strange | 3 | success | 5 | suspends | 1 | taught | 1 | themselves | 12 | timber | 5 |
| strangely | 1 | successful | 2 | suspension | 4 | Taunus | 1 | then | 12 | time | 83 |
| stranger | 1 | successfully | 1 | suspicion | 1 | tavern | 2 | Theodore | 3 | timely | 1 |
| strangers | 3 | successor | 2 | suspicious | 2 | Tavernier | 3 | theological | 1 | Times | 3 |
| strangest | 1 | succor | 1 | suspiciously | 1 | tavern's | 1 | theories | 1 | times | 11 |
| strangled | 1 | such | 46 | Susquehanna | 1 | tax | 28 | there | 124 | Timothy | 1 |
| straps | 1 | sudden | 7 | sustained | 2 | taxation | 4 | thereby | 2 | tiny | 2 |
| Strassner | 1 | suddenly | 4 | sustaining | 1 | taxed | 1 | therefor | 1 | tire | 6 |
| stream | 1 | suffer | 2 | sustains | 1 | taxes | 4 | therefore | 4 | tired | 1 |

| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| tireless | 1 | trade | 2 | trust | 3 | unfit | 2 | vacation | 7 | violations | 1 |
| tires | 3 | traders | 1 | Trust | 1 | unfriendliness | 1 | vain | 1 | violative | 1 |
| title | 7 | traditions | 1 | trustee | 1 | unhappily | 1 | validity | 1 | violent | 2 |
| titles | 1 | traffic | 1 | trustees | 2 | uniform | 2 | Valley | 2 | Virginia | 4 |
| Titus | 1 | tragedies | 2 | trusts | 1 | uniformly | 1 | valley | 1 | virtue | 3 |
| to | 1309 | tragedy | 6 | trusty | 1 | uninjured | 1 | valuable | 6 | Visalia | 1 |
| Tobani | 1 | tragic | 1 | truth | 5 | uninvited | 1 | value | 1 | Viscount | 1 |
| to-day | 85 | trail | 5 | Truxes | 1 | union | 3 | valued | 4 | visible | 1 |
| today's | 1 | train | 11 | try | 9 | Union | 4 | values | 1 | visit | 10 |
| toddle | 1 | trained | 1 | trying | 5 | united | 3 | valve | 2 | visited | 2 |
| together | 9 | training | 5 | tube | 2 | United | 18 | Van | 2 | visiting | 2 |
| toil | 1 | trainmen | 1 | tucked | 1 | units | 1 | variations | 1 | visitors | 8 |
| toilets | 1 | trains | 3 | Tudor | 1 | unity | 1 | varied | 1 | visits | 2 |
| told | 13 | transacted | 1 | Tuesday | 11 | universal | 1 | variety | 1 | vistas | 1 |
| Toledo | 2 | transcontinental | 1 | tug | 1 | universe | 1 | various | 15 | vital | 1 |
| tolerable | 1 | transfer | 1 | Tuileries | 1 | university | 1 | varying | 1 | voice | 3 |
| toli | 2 | transformed | 1 | Tulare | 1 | University | 3 | vast | 2 | void | 1 |
| tollgate | 1 | transit | 1 | tumble | 1 | unjust | 1 | vault | 2 | Vogel | 1 |
| tolls | 1 | translation | 1 | tumbling | 2 | unknown | 2 | vegetables | 1 | volume | 4 |
| Tom | 3 | transported | 1 | Tumbo | 1 | unless | 4 | vehicles | 2 | volunteered | 3 |
| tomahawk | 3 | Trapp | 1 | tumor | 1 | unloading | 2 | vengeance | 1 | Vomberge | 1 |
| Tonawanda | 1 | travel | 3 | tunnel | 5 | unlooked | 1 | venture | 1 | Von | 1 |
| to-morrow | 25 | traveler | 2 | Tunnels | 2 | unmeasured | 1 | ventured | 1 | Voss | 1 |
| to-morrows | 1 | travelers | 5 | Tupper | 2 | unpleasant | 1 | venturing | 1 | vote | 15 |
| to-morrow's | 1 | treason | 2 | Turkey | 2 | unpleasantness | 1 | veranda | 1 | voted | 5 |
| ton | 1 | treasure | 9 | turn | 4 | unprecedented | 2 | verbal | 1 | voter | 1 |
| to-night | 7 | treasurer | 5 | turned | 9 | unpurchasable | 1 | verdict | 1 | voters | 3 |
| tongued | 1 | Treasurer | 1 | Twift | 1 | unreasonable | 1 | Verena | 1 | votes | 10 |
| tons | 2 | treasures | 3 | twined | 3 | unrecognized | 1 | verify | 1 | voting | 3 |
| Tony | 1 | treat | 1 | twining | 1 | unscrupulous | 1 | Verite | 1 | vow | 1 |
| too | 17 | treated | 3 | twins | 1 | unseen | 2 | verse | 3 | vows | 1 |
| took | 14 | treaties | 1 | type | 6 | unset | 1 | very | 31 | voyage | 2 |
| top | 9 | treating | 1 | types | 2 | unsettled | 1 | vessel | 3 | Wade | 1 |
| Topeka | 1 | treatment | 1 | typical | 1 | unsigned | 1 | vessels | 7 | wading | 1 |
| topic | 1 | Tredes | 1 | tyranny | 2 | unsuccessful | 1 | vest | 1 | Wagner | 1 |
| topics | 1 | Tree | 1 | ugly | 2 | unsuspecting | 2 | veteran | 4 | waist | 1 |
| toppled | 2 | tree | 1 | unable | 7 | unthinkable | 1 | veteran's | 1 | Wait | 1 |
| topsy-turvy | 1 | trees | 2 | unanimous | 2 | until | 52 | Veto | 1 | wait | 5 |
| torn | 1 | tremble | 1 | unassuming | 1 | untrue | 1 | vetoed | 1 | waited | 1 |
| Toronto | 1 | tremendous | 1 | unauthorized | 1 | unusual | 5 | vetoes | 1 | waiting | 3 |
| torpedo | 1 | trend | 1 | unavailing | 1 | unusually | 2 | vexing | 1 | waits | 1 |
| torrent | 1 | Trevenec | 1 | unbearable | 1 | unwieldy | 1 | Via | 1 | waived | 1 |
| Torriento | 3 | trial | 3 | unbearably | 1 | up | 74 | vicar | 1 | Wallace | 1 |
| torture | 3 | trials | 2 | unbecoming | 1 | upheld | 1 | Vice | 2 | Wales | 1 |
| torturings | 1 | tribe | 1 | unbelief | 1 | upon | 47 | vices | 1 | walk | 4 |
| total | 9 | Tribe | 1 | unbroken | 1 | upper | 2 | vicinity | 4 | walked | 6 |
| totally | 1 | Tribune | 1 | uncertain | 2 | upset | 1 | vicious | 1 | walking | 1 |
| totals | 1 | tribute | 1 | uncertainly | 2 | Upton | 1 | victim | 8 | walks | 2 |
| Totto | 1 | tributes | 1 | uncle | 2 | upward | 2 | victims | 2 | Waltz | 1 |
| touch | 2 | trick | 2 | Uncle | 12 | upwards | 1 | Victoria | 2 | wall | 1 |
| touching | 1 | tried | 6 | unconcerned | 1 | urge | 1 | Victorian | 2 | walled | 1 |
| tour | 14 | trifle | 2 | unconscious | 3 | urged | 2 | victor | 1 | walls | 4 |
| toured | 1 | trifles | 1 | uncontrollable | 1 | urgent | 2 | victories | 1 | Walter | 4 |
| touring | 1 | trigger | 1 | uncrowned | 1 | urges | 2 | victorious | 1 | wander | 1 |
| tourists | 2 | trim | 3 | undefended | 3 | urging | 4 | victory | 1 | wandered | 1 |
| tournaments | 1 | trimmed | 1 | undeniably | 1 | us | 9 | Vienna | 2 | wandering | 1 |
| tours | 1 | trimmings | 1 | under | 64 | use | 8 | Viennese | 2 | want | 16 |
| touted | 1 | Trimper | 3 | undergo | 1 | used | 9 | View | 1 | wanted | 2 |
| toward | 5 | Trimper's | 1 | undergone | 3 | useful | 3 | view | 11 | wanting | 1 |
| towards | 2 | trip | 31 | underground | 2 | usefulness | 1 | viewpoint | 1 | wants | 4 |
| towed | 1 | Tripoli | 1 | understand | 1 | useless | 2 | views | 2 | War | 4 |
| Tower | 1 | trips | 1 | understanding | 1 | user | 1 | vigorous | 1 | war | 11 |
| towering | 1 | Trojans | 1 | understood | 2 | users | 1 | vigorously | 1 | ward | 2 |
| town | 9 | trolley | 3 | undertaken | 1 | using | 1 | villa | 1 | warm | 2 |
| Town | 1 | trophy | 1 | undertaking | 2 | usual | 3 | village | 5 | warmed | 1 |
| Toye | 6 | trot | 3 | underwriting | 1 | usually | 1 | villagers | 1 | warned | 1 |
| trace | 2 | trouble | 5 | undoubtedly | 3 | Utica | 3 | villages | 1 | warning | 3 |
| traced | 2 | troups | 3 | undressing | 1 | utterly | 1 | Vinyke | 1 | warrant | 5 |
| tracing | 2 | trout | 2 | undue | 1 | vacant | 1 | Vinykes | 1 | warranted | 1 |
| track | 8 | Troy | 4 | unexpected | 3 | vacancies | 1 | violated | 1 | warrants | 2 |
| tracks | 2 | true | 9 | unexpectedly | 1 | vacancy | 1 | violation | 2 | Warren | 4 |
| tract | 1 | trunk | 3 | unfair | 1 | | | | | warships | 1 |
| tracts | 1 | trunks | 1 | | | | | | | | |

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| Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence | Words | Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| was | 485 | welfare | 1 | Whitehead | 3 | wink | 1 | word | 6 | wrongs | 1 |
| wash | 1 | well | 29 | White's | 2 | winner | 1 | worded | 1 | wrote | 3 |
| washed | 2 | well-shaped | 1 | Whittier | 1 | winners | 2 | words | 3 | wrought | 1 |
| Washington | 22 | Welsh | 4 | who | 167 | winning | 4 | wore | 2 | Wurth | 2 |
| waste | 1 | Welshmen | 1 | whoever | 1 | winter | 1 | work | 75 | Wylie | 5 |
| wasted | 1 | Weltlaufer | 1 | whole | 17 | wiped | 2 | workable | 1 | Wyman | 1 |
| watch | 7 | Wendlich | 1 | wholesale | 3 | wiping | 1 | worked | 1 | Wyoming | 1 |
| watched | 2 | Wenrich | 1 | wholesalers | 3 | wire | 8 | workers | 1 | | |
| watchful | 1 | went | 26 | wholesome | 1 | wireless | 1 | working | 11 | yacht | 2 |
| water | 19 | were | 187 | whom | 23 | wires | 2 | workings | 1 | yard | 7 |
| Waterford | 1 | west | 3 | whose | 14 | wiry | 1 | workmanship | 2 | Yard | 1 |
| watermelons | 1 | West | 24 | why | 58 | Wisconsin | 1 | workmen | 4 | yards | 6 |
| Watseka | 1 | western | 1 | Wichita | 1 | wise | 1 | works | 4 | year | 61 |
| Watson | 4 | Western | 5 | wide | 4 | wish | 6 | Works | 1 | year's | 2 |
| wave | 1 | Westerners | 1 | widely | 1 | wished | 1 | world | 17 | years | 81 |
| wavered | 1 | Westers | 1 | Widener | 1 | wishes | 1 | world-famous | 1 | yelled | 1 |
| way | 42 | Westminster | 1 | wife | 28 | wishing | 1 | world's | 2 | yellow | 1 |
| Wayne | 1 | Weston | 1 | wife's | 5 | wit | 2 | worlds | 1 | yes | 5 |
| ways | 2 | what | 54 | Wilbur | 4 | with | 280 | Worms | 1 | yesterday | 49 |
| we | 40 | whatever | 2 | wild | 2 | withdrew | 1 | worn | 2 | yesterday's | 1 |
| weak | 2 | wheat | 2 | Wilhelm | 1 | within | 18 | worse | 2 | yet | 21 |
| weakness | 1 | wheel | 3 | Wilkins | 1 | without | 33 | worst | 2 | yield | 1 |
| wealth | 4 | Wheeler | 7 | Wilkinson | 3 | withstand | 1 | worth | 8 | yielding | 1 |
| wealthy | 2 | wheels | 2 | will | 347 | witness | 4 | Worth | 1 | Yohe | 1 |
| weapon | 1 | when | 134 | Will | 1 | witnessed | 1 | worthlessness | 1 | York | 58 |
| wear | 3 | whence | 1 | Willert | 3 | witnesses | 8 | worry | 1 | Yorkshire | 1 |
| wearer | 1 | whenever | 1 | William | 24 | witness-stand | 1 | would | 111 | you | 26 |
| wearers | 1 | where | 47 | Williams | 4 | wives | 1 | wound | 5 | Young | 10 |
| wearing | 2 | whereabouts | 1 | Williamsburg | 1 | Woelfel | 1 | wounded | 2 | young | 14 |
| weather | 7 | whereas | 1 | Williamson | 1 | woman | 35 | wounds | 1 | younger | 2 |
| Weather | 1 | whereby | 1 | willing | 4 | womanliness | 1 | wrap | 1 | youngest | 3 |
| weavers | 1 | wherein | 1 | willingness | 1 | woman's | 2 | wrapped | 1 | youngsters | 2 |
| Wednesday | 3 | whether | 9 | Wilson | 7 | women | 21 | wreck | 7 | your | 7 |
| week | 30 | which | 226 | Wilson's | 1 | Women | 2 | wrecked | 3 | yourself | 1 |
| weekly | 1 | while | 36 | Wilsons | 1 | women's | 3 | wrecking | 1 | | |
| weeks | 17 | whirl | 1 | win | 2 | won | 2 | wrecks | 1 | Zarferino | 1 |
| Weeks | 1 | whirlpool | 1 | wind | 7 | wonder | 2 | Wright | 10 | zeal | 1 |
| weigh | 2 | Whirlpool | 1 | windbroken | 2 | wonderful | 8 | write | 2 | zero | 1 |
| weighing | 7 | whiskey | 4 | window | 5 | wonders | 1 | writer | 3 | Zimmerman | 1 |
| weighs | 1 | whistle | 1 | winds | 1 | Wood | 1 | writers | 1 | zinc | 1 |
| Weill | 3 | white | 5 | wind's | 1 | wood | 1 | writes | 4 | zone | 1 |
| Weimar | 2 | White | 9 | wine | 4 | wooden | 3 | writing | 4 | Zoo | 1 |
| Weimar's | 1 | Whitcomb | 1 | Winer | 2 | Woods | 1 | written | 5 | Zubayala | 1 |
| welcome | 2 | white-crested | 1 | Winett | 2 | wool | 1 | wrong | 4 | Zuleika | 1 |
| welcomed | 2 | Whitehall | 1 | wing | 2 | woolen | 3 | wronged | 1 | | |

# APPENDIX D

Alphabetical list of all possible letter groups within syllable limits as authorized in the International Standard Dictionary with the recurrence of each, based upon the whole-word count presented in Appendix C (*ante*).

| Letter groups | Total recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| aa | 2 | aire | 2 | ann | 14 | ast | 162 | bac | 29 | bent | 2 | blig | 1 | bound | 6 |
| aac | 1 | aire's | 1 | anne | 3 | aste | 5 | bach | 3 | ber | 185 | blin | 9 | bounds | 1 |
| aas | 1 | airn | 1 | ans | 52 | asts | 2 | back | 26 | berg | 5 | blind | 4 | bour | 3 |
| ab | 58 | airns | 1 | an's | 9 | at | 1828 | bad | 12 | berk | 1 | bling | 5 | bourg | 1 |
| abe | 1 | airs | 11 | ant | 123 | atc | 21 | bag | 5 | bers | 48 | blis | 1 | bous | 1 |
| abes | 1 | ais | 16 | ants | 20 | atch | 21 | bai | 8 | bert | 39 | bliss | 1 | bout | 74 |
| abs | 2 | aise | 4 | anx | 2 | ate | 335 | bail | 4 | berth | 1 | blo | 36 | bouts | 2 |
| ac | 557 | aist | 1 | ap | 239 | ates | 77 | bal | 46 | bert's | 2 | bloc | 10 | bov | 8 |
| ace | 67 | ait | 21 | ape | 17 | ath | 54 | ball | 33 | bes | 4 | block | 10 | bove | 8 |
| ach | 89 | aith | 3 | apes | 3 | aths | 2 | balle | 1 | best | 1 | blocks | 3 | bow | 4 |
| acht | 2 | aits | 4 | aph | 7 | ats | 16 | balls | 4 | bet | 13 | bloo | 3 | bowl | 1 |
| ack | 77 | aiv | 1 | aphs | 2 | au | 195 | bam | 1 | beth | 4 | bloom | 2 | bows | 1 |
| acks | 5 | aix | 1 | app | 15 | auc | 4 | ban | 52 | bev | 1 | blooms | 1 | box | 6 |
| acq | 1 | aiz | 1 | app's | 1 | auch | 2 | band | 30 | bey | 9 | bloos | 1 | boy | 28 |
| acqu | 1 | aize | 1 | aps | 13 | aud | 4 | bands | 3 | bi | 173 | blos | 3 | boys | 16 |
| acque | 1 | ak | 117 | aq | 1 | auds | 1 | bank | 14 | bia | 1 | blot | 2 | boy's | 1 |
| act | 81 | ake | 92 | ar | 1719 | auf | 15 | bap | 1 | bic | 6 | blow | 8 | br | 232 |
| acts | 14 | akes | 30 | arb | 1 | aug | 16 | bar | 40 | bid | 9 | blu | 10 | bra | 41 |
| ad | 612 | al | 1435 | arc | 28 | augh | 16 | bard | 1 | bie | 1 | blue | 9 | brac | 3 |
| add | 5 | ald | 10 | arce | 6 | aught | 3 | bare | 2 | biel | 1 | bluf | 1 | brace | 2 |
| adds | 2 | ale | 33 | arch | 20 | aul | 15 | bark | 2 | big | 31 | bluff | 1 | brad | 2 |
| ade | 109 | ales | 7 | ard | 159 | aul's | 1 | barn | 1 | bil | 66 | bly | 23 | brae | 1 |
| ades | 3 | alf | 17 | ards | 18 | ault | 5 | barne | 1 | bile | 17 | bo | 307 | brag | 1 |
| ads | 18 | alfe | 1 | ard's | 1 | aults | 1 | barnes | 1 | biles | 1 | boa | 33 | brai | 3 |
| ae | 8 | alk | 35 | are | 253 | aum | 1 | bars | 2 | bill | 30 | boar | 20 | brain | 1 |
| ael | 5 | alks | 8 | ares | 6 | aun | 4 | bart | 1 | bills | 1 | board | 20 | brak | 1 |
| aer | 1 | alk's | 1 | are's | 1 | aunc | 2 | bas | 16 | bin | 19 | boards | 2 | brake | 1 |
| af | 191 | all | 301 | arf | 1 | aunch | 2 | base | 9 | binc | 4 | boas | 2 | bran | 1 |
| afe | 6 | alle | 1 | arg | 71 | aunt | 2 | bass | 1 | bines | 1 | boast | 2 | branc | 1 |
| aff | 4 | alls | 23 | arge | 48 | aur | 1 | bat | 18 | bing | 10 | boasts | 1 | branch | 1 |
| aft | 12 | alm | 8 | ark | 31 | aus | 74 | bate | 12 | bir | 4 | boat | 11 | bras | 3 |
| afts | 2 | alms | 3 | arks | 3 | ause | 41 | bates | 1 | bird | 1 | boats | 3 | brass | 2 |
| aft's | 1 | alp | 3 | arl | 46 | aust | 4 | bath | 2 | birds | 1 | bob | 1 | brat | 2 |
| ag | 177 | alph | 1 | arle | 39 | aut | 3 | baths | 1 | birt | 3 | bod | 42 | brate | 2 |
| age | 75 | als | 38 | arles | 39 | aute | 3 | bau | 8 | birth | 3 | bog | 1 | brav | 1 |
| agg | 1 | alse | 5 | arm | 22 | aux | 5 | bauc | 2 | bis | 2 | bol | 6 | brave | 1 |
| ags | 3 | alt | 22 | arms | 3 | av | 405 | bauch | 2 | bish | 2 | bold | 1 | bre | 19 |
| ag's | 1 | alth | 12 | arn | 26 | ave | 290 | baum | 1 | bit | 6 | bom | 1 | brea | 10 |
| agu | 6 | alths | 1 | arne | 1 | aves | 4 | bay | 8 | bite | 1 | bomb | 1 | bread | 1 |
| ague | 6 | alts | 1 | arnes | 1 | avr | 1 | be | 1208 | bl | 251 | bon | 10 | break | 8 |
| agues | 1 | altz | 1 | arns | 1 | avre | 1 | bea | 53 | bla | 12 | bond | 2 | breas | 1 |
| ah | 7 | alv | 2 | arp | 2 | aw | 93 | beac | 19 | blac | 6 | bone | 1 | breast | 1 |
| ahl | 2 | alve | 2 | arps | 1 | awe | 1 | beach | 19 | black | 6 | bons | 1 | bree | 4 |
| ahl's | 1 | am | 377 | arpst | 1 | awes | 1 | bead | 1 | blad | 1 | boo | 15 | breed | 1 |
| ai | 672 | ame | 147 | ars | 133 | awk | 14 | beam | 1 | blade | 1 | book | 10 | breez | 3 |
| aid | 98 | ames | 36 | arse | 4 | awl | 1 | bean | 1 | blai | 1 | books | 2 | breeze | 2 |
| aide | 6 | amp | 19 | arse's | 1 | awn | 6 | beans | 1 | blair | 1 | boom | 2 | bren | 2 |
| aids | 2 | ams | 14 | arsh | 1 | aws | 7 | bear | 10 | blairs | 1 | booms | 1 | brent | 1 |
| aig | 13 | an | 3115 | ar's | 2 | ax | 54 | beat | 7 | blam | 1 | boos | 2 | brew | 1 |
| aigh | 3 | ance | 105 | art | 107 | ay | 677 | beau | 13 | blame | 1 | boost | 2 | bri | 65 |
| aight | 3 | anch | 6 | arth | 9 | ayl | 2 | bec | 4 | blan | 3 | bor | 37 | bric | 1 |
| aign | 10 | anche | 1 | arth's | 1 | ayle | 2 | beck | 3 | blanc | 1 | born | 9 | brick | 1 |
| ail | 91 | and | 1576 | arts | 10 | ayles | 2 | bed | 9 | blance | 1 | bors | 9 | brid | 10 |
| ails | 8 | ands | 25 | arv | 1 | ayn | 14 | bee | 222 | blane | 1 | bos | 10 | bridg | 8 |
| aim | 30 | and's | 2 | as | 1650 | ayne | 13 | beec | 1 | blank | 1 | boss | 2 | bridge | 8 |
| aims | 9 | ane | 19 | ase | 54 | aynes | 1 | beech | 1 | ble | 169 | bost | 1 | brids | 1 |
| ain | 293 | anes | 1 | ash | 49 | ays | 76 | been | 219 | bled | 1 | bot | 7 | brie | 3 |
| aine | 5 | ang | 63 | ashe | 1 | ay's | 1 | beg | 3 | blee | 2 | bots | 1 | brief | 3 |
| aines | 3 | ange | 37 | ask | 51 | az | 6 | bel | 10 | bler | 2 | bou | 95 | brig | 5 |
| ains | 59 | anged | 3 | asks | 2 |  |  | bell | 8 | bles | 3 | boug | 9 | brigh | 5 |
| ainst | 35 | angs | 3 | asm | 1 | ba | 290 | ben | 25 | blest | 2 | bough | 9 | bright | 2 |
| aint | 24 | ank | 32 | ass | 53 | bab | 2 | benc | 4 | blew | 3 | bought | 9 | brin | 17 |
| aints | 4 | anks | 1 | asse | 1 | babe | 1 | bench | 4 | blex | 1 | boul | 1 | bring | 17 |
| air | 86 |  |  |  |  | babes | 1 | bend | 5 | bli | 11 | boun | 6 | brings | 1 |

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Table of letter groups and their total recurrence (columns read left to right, top to bottom).

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bris | 5 | burke | 2 | caus | 56 | chea | 3 | chur | 28 | climb | 1 | core | 7 | crete | 2 |
| brisk | 1 | burn | 11 | cause | 41 | cheap | 3 | chure | 28 | clin | 9 | cores | 2 | crew | 5 |
| brit | 22 | burne | 1 | cav | 7 | chec | 10 | church | 28 | cline | 3 | corn | 2 | crews | 1 |
| britt | 2 | burns | 1 | caz | 1 | check | 10 | chut | 2 | clinex | 2 | corp | 3 | cri | 38 |
| bro | 95 | burns' | 1 | cay | 1 | checks | 2 | chute | 2 | clip | 5 | corps | 3 | crib | 6 |
| broa | 10 | burs | 1 | ce | 869 | ched | 6 | ci | 138 | clo | 55 | corpse | 2 | cribe | 4 |
| broac | 2 | burst | 1 | cea | 3 | chee | 2 | cia | 87 | cloc | 20 | cos | 20 | cribes | 2 |
| broach | 2 | burt | 2 | ceas | 3 | cheer | 2 | cial | 77 | clock | 20 | cost | 19 | crie | 4 |
| broad | 8 | bus | 46 | cease | 2 | chef | 2 | cials | 8 | clos | 23 | cot | 10 | cried | 5 |
| brod | 1 | buse | 1 | ced | 1 | chem | 7 | cian | 9 | close | 12 | cote | 1 | cries | 1 |
| broe | 2 | bush | 9 | cee | 36 | cheme | 3 | cians | 2 | clot | 9 | cotch | 1 | crim | 11 |
| broi | 1 | but | 142 | ceed | 34 | chen | 1 | cid | 26 | cloth | 9 | cots | 2 | crime | 7 |
| broid | 1 | bute | 2 | ceeds | 4 | cheq | 1 | cide | 11 | clothe | 3 | cou | 233 | crimes | 1 |
| brok | 3 | buy | 7 | cei | 31 | cher | 4 | cides | 1 | clothes | 2 | couc | 1 | crip | 8 |
| broke | 3 | bw | 1 | ceip | 1 | chi | 129 | cie | 25 | clou | 1 | couch | 1 | cript | 2 |
| bron | 1 | bwa | 1 | ceipt | 1 | chid | 1 | cien | 17 | cloud | 1 | coul | 35 | crit | 7 |
| bronz | 1 | by | 430 | ceiv | 30 | chids | 1 | cient | 12 | clu | 62 | could | 35 | crite | 2 |
| bronze | 1 | bye | 1 | ceive | 6 | chie | 24 | cier | 1 | club | 32 | coun | 91 | cro | 40 |
| broo | 10 |  |  | cel | 36 | chief | 15 | cies | 7 | clud | 13 | count | 18 | crom | 1 |
| brooc | 1 | ca | 814 | cell | 3 | chiev | 6 | cif | 4 | clude | 5 | counts | 2 | crop | 1 |
| brooch | 1 | cab | 10 | cem | 1 | chieve | 4 | cil | 26 | cludes | 2 | coup | 6 | crops | 1 |
| brook | 7 | cad | 4 | cen | 90 | chil | 34 | cin | 14 | clue | 1 | cour | 87 | cros | 11 |
| brooks | 2 | cade | 3 | cend | 4 | child | 15 | cing | 4 | clur | 1 | cours | 18 | cross | 11 |
| broon | 2 | cai | 3 | cends | 1 | childs | 1 | cio | 13 | clure | 1 | course | 17 | crosse | 1 |
| broons | 1 | cair | 1 | cene | 10 | child's | 1 | cion | 1 | co | 1311 | court | 61 | crow | 27 |
| brot | 13 | cairn | 1 | cenes | 5 | chin | 14 | ciou | 12 | coa | 14 | courts | 11 | crowd | 13 |
| broth | 13 | cairns | 1 | cens | 2 | chine | 9 | cious | 12 | coal | 6 | court's | 1 | crowds | 2 |
| brou | 25 | cal | 91 | cense | 2 | chis | 8 | cip | 1 | coar | 1 | cous | 1 | crowe | 1 |
| broug | 24 | cale | 1 | cent | 42 | chisc | 2 | cir | 12 | coars | 1 | cov | 37 | crown | 13 |
| brough | 24 | calf | 1 | cents | 6 | chm | 3 | cis | 21 | coarse | 1 | cow | 2 | cru | 20 |
| brought | 24 | calfe | 1 | cep | 30 | chme | 1 | cise | 1 | coas | 6 | cowe | 1 | crub | 2 |
| brous | 1 | call | 37 | cept | 23 | chmci | 1 | cism | 2 | coast | 6 | cowes | 1 | crui | 7 |
| brow | 6 | calls | 1 | cer | 62 | chmi | 2 | cisms | 1 | coat | 1 | cox | 1 | cruis | 5 |
| brown | 6 | calm | 5 | cere | 1 | chmid | 2 | cist | 1 | coate | 1 | cq | 1 | cruise | 2 |
| bru | 10 | calp | 2 | cern | 12 | chmidt | 2 | cists | 1 | coates | 1 | cqu | 1 | cruit | 2 |
| brui | 7 | cals | 2 | cers | 25 | chn | 2 | cit | 117 | cob | 2 | cque | 1 | cruits | 2 |
| bruis | 7 | cam | 66 | ces | 56 | chne | 1 | cite | 4 | coc | 1 | cr | 204 | crun | 1 |
| brul | 1 | came | 40 | cese | 1 | chnci | 1 | civ | 4 | cock | 1 | cra | 40 | crunc | 1 |
| brut | 1 | camp | 13 | cess | 33 | chni | 1 | ck | 271 | cod | 1 | craf | 4 | crunch | 1 |
| brute | 4 | can | 153 | ch | 1121 | chnit | 1 | cke | 1 | code | 1 | craft | 3 | crus | 3 |
| bry | 2 | canc | 1 | cha | 199 | chnitz | 1 | cks | 27 | coe | 2 | crafts | 1 | crush | 3 |
| bryn | 1 | cance | 1 | chae | 5 | cho | 10 | ck's | 2 | coeu | 1 | cram | 1 | cry | 1 |
| bs | 7 | cans | 6 | chael | 5 | choa | 1 | cl | 342 | coeur | 1 | cramp | 1 | cs | 4 |
| bt | 22 | cant | 1 | chai | 14 | choat | 1 | cla | 56 | coet | 1 | cran | 2 | ct | 284 |
| bts | 1 | cap | 42 | chain | 1 | choate | 1 | clai | 25 | coetz | 1 | crane | 1 | cts | 34 |
| bu | 416 | cape | 16 | chains | 1 | choe | 1 | claim | 25 | cof | 5 | crank | 1 | cu | 217 |
| bub | 1 | capes | 3 | chair | 13 | choen | 1 | claims | 8 | coff | 1 | crap | 2 | cub | 1 |
| buc | 6 | car | 133 | chal | 2 | chog | 1 | clap | 1 | cog | 1 | cras | 1 | cube | 1 |
| buck | 6 | card | 6 | cham | 7 | choi | 2 | clar | 18 | coi | 1 | crash | 1 | cud | 1 |
| buck's | 1 | cards | 1 | champ | 1 | choic | 2 | clare | 6 | coin | 1 | crat | 26 | cue | 6 |
| bud | 2 | care | 17 | chan | 38 | choice | 2 | clares | 3 | col | 70 | crate | 2 | cui | 1 |
| budg | 2 | cares | 2 | chance | 5 | chol | 4 | clark | 4 | cold | 2 | cratch | 2 | cuit | 1 |
| bue | 1 | carf | 1 | chance | 3 | chon | 3 | clas | 11 | cole | 1 | crats | 8 | cul | 22 |
| buf | 48 | carl | 1 | chang | 23 | chong | 3 | class | 10 | coll | 4 | craw | 1 | culp | 1 |
| buff | 1 | cars | 17 | change | 15 | choo | 24 | clay | 1 | colt | 4 | crawl | 1 | culp's | 1 |
| buffs | 1 | cart | 1 | changed | 3 | chool | 23 | cle | 142 | com | 356 | craz | 1 | cult | 2 |
| bui | 52 | cas | 66 | chant | 2 | chools | 8 | clea | 14 | comb | 2 | cre | 65 | cum | 3 |
| buil | 52 | case | 31 | chap | 4 | choos | 1 | clean | 7 | combs | 1 | crea | 17 | cum's | 1 |
| build | 43 | cash | 1 | char | 103 | chop | 2 | clear | 7 | come | 53 | cream | 1 | cup | 4 |
| built | 9 | cast | 11 | chard | 1 | chor | 1 | cled | 2 | comes | 6 | creams | 1 | cur | 40 |
| bul | 6 | cat | 25 | charg | 40 | chos | 1 | clel | 6 | comp | 3 | creas | 16 | cure | 7 |
| bulk | 2 | cate | 1 | charge | 25 | chr | 61 | clen | 1 | con | 108 | crease | 5 | curv | 2 |
| bum | 4 | cates | 1 | charl | 39 | chri | 5 | cler | 31 | cons | 1 | cred | 12 | curve | 1 |
| bump | 4 | cath | 3 | charle | 39 | chris | 5 | clerk | 28 | coo | 5 | cree | 9 | cus | 41 |
| bumps | 1 | cats | 1 | charles | 39 | chro | 1 | clerks | 13 | cook | 1 | creek | 7 | cuse | 4 |
| bun | 7 | cau | 61 | charm | 2 | chron | 1 | clerk's | 1 | cooke | 1 | creeks | 1 | cush | 1 |
| bunc | 1 | caug | 1 | chas | 8 | chry | 55 | cles | 11 | cool | 3 | creen | 1 | cuss | 7 |
| bunch | 1 | caugh | 1 | chase | 1 | chrys | 55 | clev | 25 | coon | 1 | creens | 1 | cut | 21 |
| bung | 1 | caught | 1 | chat | 3 | cht | 2 | cleve | 25 | coons | 1 | creet | 1 | cute | 2 |
| bur | 75 | caul | 1 | chau | 15 | chu | 35 | cli | 27 | cop | 15 | cres | 2 | cuth | 2 |
| burg | 26 |  |  | chauf | 14 | chun | 1 | clif | 3 | cor | 84 | crest | 1 | cuts | 2 |
| burk | 2 |  |  | che | 39 | chunk | 1 | clim | 4 | cord | 23 | cret | 6 | cuy | 5 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| cy | 69 | dem | 33 | dog | 4 | drov | 1 | eap | 11 | ees | 17 | emed | 7 | esh | 7 |
| cyl | 10 | demn | 2 | dogs | 2 | drove | 1 | eaps | 1 | eet | 121 | emes | 1 | ess | 268 |
| cz | 2 | den | 137 | dol | 3 | drow | 12 | ear | 372 | eeth | 6 | emn | 4 | esse | 1 |
| cza | 2 | denc | 23 | dom | 5 | drown | 12 | earch | 10 | eets | 18 | emp | 25 | est | 194 |
| czar | 2 | dence | 23 | don | 56 | droy | 1 | eard | 12 | eev | 1 | empt | 23 | ests | 18 |
|  |  | dene | 1 | done | 19 | dru | 2 | eare | 3 | eeve | 1 | empts | 1 | et | 454 |
| da | 480 | dens | 5 | dons | 2 | drug | 2 | eare's | 1 | eez | 5 | ems | 20 | etc | 10 |
| dac | 2 | dense | 1 | doo | 9 | dry | 3 | earl | 6 | eeze | 3 | en | 2465 | etch | 9 |
| dack | 1 | dent | 65 | doom | 1 | ds | 183 | earn | 20 | ef | 124 | enc | 119 | ete | 26 |
| dacks | 1 | dents | 10 | door | 12 | d's | 3 | earns | 1 | efe | 1 | ence | 107 | eth | 37 |
| dai | 6 | dep | 9 | doors | 5 | du | 138 | ears | 93 | efs | 1 | ench | 5 | ets | 38 |
| dal | 2 | dept | 1 | dop | 11 | duc | 37 | ear's | 2 | eft | 34 | end | 187 | ett | 32 |
| dale | 1 | depth | 1 | dopt | 10 | duce | 2 | eart | 20 | eg | 72 | ends | 45 | ette | 10 |
| dam | 6 | der | 169 | dor | 13 | duch | 2 | earth | 8 | ege | 8 | end's | 1 | ettes | 1 |
| dame | 2 | ders | 20 | dore | 3 | duck | 1 | earth's | 1 | eh | 2 | ene | 16 | etts | 4 |
| dams | 1 | des | 40 | dorf | 1 | duct | 10 | earts | 3 | ehl | 1 | enes | 5 | ett's | 5 |
| dan | 33 | det | 4 | dors | 1 | ducts | 1 | eas | 116 | ei | 240 | eng | 20 | etz | 2 |
| danc | 2 | dett | 4 | dot | 1 | dud | 1 | ea's | 1 | eic | 2 | engt | 15 | eu | 38 |
| dant | 3 | dette | 4 | dote | 1 | due | 7 | ease | 12 | eich | 2 | ength | 15 | eul | 8 |
| dap | 1 | dev | 2 | dotes | 1 | duf | 2 | east | 32 | eid | 1 | engths | 1 | euls | 2 |
| dar | 9 | dew | 1 | dou | 28 | duff | 1 | eat | 127 | eig | 45 | enn | 11 | euls' | 2 |
| dard | 1 | dg | 49 | doub | 21 | dul | 3 | eath | 25 | eigh | 24 | ens | 44 | eur | 5 |
| dare | 1 | dge | 32 | doubt | 17 | dulg | 2 | eaths | 1 | eight | 11 | en's | 21 | eurs | 2 |
| dars | 3 | dges | 9 | doubts | 1 | dulge | 2 | eats | 2 | eights | 2 | ense | 22 | ev | 295 |
| darse | 3 | dh | 1 | doug | 4 | dull | 1 | eau | 25 | eighs | 1 | ent | 574 | eve | 79 |
| darse's | 1 | dhi | 1 | dough | 2 | dum | 2 | eaus | 5 | eigu | 11 | enth | 2 | eves | 3 |
| das | 9 | dhin | 1 | dous | 1 | dumb | 1 | eaux | 3 | eil | 7 | ents | 102 | ew | 265 |
| dash | 9 | di | 545 | dow | 36 | dump | 1 | eav | 28 | eill | 4 | eo | 88 | ewn | 1 |
| dat | 38 | dia | 8 | down | 29 | dun | 2 | eave | 13 | eille | 1 | eof | 1 | ews | 43 |
| date | 38 | dian | 7 | dox | 5 | dup | 2 | eaves | 3 | cille | 1 | eon | 6 | ew's | 1 |
| dates | 19 | dians | 1 | doz | 7 | dur | 44 | eb | 5 | ein | 3 | eor | 35 | ex | 287 |
| dau | 9 | dic | 17 | dr | 124 | dus | 4 | ebt | 5 | eip | 1 | eorg | 27 | ext | 29 |
| daug | 9 | dick | 1 | dra | 16 | dust | 2 | ec | 361 | eipt | 1 | eorge | 27 | ey | 307 |
| daugh | 9 | dict | 9 | drag | 1 | dw | 4 | ecc | 5 | eir | 112 | ep | 145 | eye | 7 |
| dav | 1 | did | 46 | dral | 1 | dwe | 3 | ech | 10 | eis | 1 | eph | 6 | eyes | 4 |
| daw | 1 | die | 29 | dram | 1 | dwel | 3 | eck | 34 | eise | 1 | eph's | 1 | eyn | 1 |
| dawn | 1 | died | 18 | drau | 1 | dwell | 2 | ecks | 5 | eisch | 1 | eps | 3 | eys | 5 |
| day | 335 | dieh | 1 | draw | 7 | dwelt | 1 | ect | 149 | eit | 4 | ept | 33 | ez | 7 |
| days | 28 | diehl | 1 | drawn | 3 | dwi | 1 | ects | 12 | eitz | 2 | epth | 1 | eze | 3 |
| day's | 1 | dier | 4 | dre | 44 | dwin | 1 | ed | 2074 | eiv | 30 | eq | 2 | fa | 353 |
| daz | 1 | diers | 2 | drea | 2 | dy | 29 | edc | 2 | eive | 6 | er | 3516 | fac | 50 |
| dd | 6 | dies | 4 | dread | 1 | dy's | 2 | edes | 2 | eiz | 2 | erc | 3 | face | 7 |
| dds | 2 | dif | 29 | dream | 1 |  |  | edg | 12 | eize | 2 | erce | 3 | fact | 27 |
| de | 1056 | dig | 3 | dren | 19 | ea | 1148 | edge | 6 | ek | 68 | erd | 1 | facts | 5 |
| dea | 56 | dim | 1 | dren's | 2 | eac | 79 | eds | 7 | eks | 21 | ere | 432 | fad | 1 |
| dead | 16 | din | 21 | dres | 17 | eace | 1 | ee | 809 | el | 536 | eres | 2 | fads | 1 |
| deaf | 1 | ding | 17 | dress | 17 | each | 78 | eec | 12 | elc | 1 | erg | 9 | fai | 48 |
| deal | 20 | dip | 1 | drew | 6 | ead | 156 | eece | 4 | elch | 1 | erge | 3 | fail | 15 |
| deals | 1 | dir | 2 | drew's | 1 | eads | 5 | eech | 7 | eld | 63 | erk | 29 | fain | 1 |
| dean | 2 | dis | 146 | dri | 41 | eat | 1 | eed | 58 | elds | 4 | erks | 13 | faint | 1 |
| dean's | 1 | dise | 1 | dria | 1 | eag | 6 | eeds | 6 | elf | 11 | erk's | 1 | fair | 29 |
| deat | 14 | dist | 1 | dric | 5 | eagu | 6 | eef | 2 | elft | 2 | erm | 13 | fairs | 9 |
| death | 14 | dit | 8 | drich | 5 | eague | 6 | eefe | 1 | elfth | 2 | erms | 10 | fait | 3 |
| death's | 1 | dite | 1 | drie | 2 | eagues | 1 | eefs | 1 | elfts | 2 | ern | 74 | faith | 3 |
| deau | 1 | ditch | 1 | drien | 2 | eak | 22 | eek | 67 | elk | 5 | erp | 1 | fal | 14 |
| deaux | 1 | dite | 1 | dril | 10 | eal | 61 | eeks | 21 | elks | 2 | err | 9 | falk | 7 |
| deav | 2 | dith | 4 | drill | 10 | ealm | 1 | eel | 24 | ell | 92 | erre | 4 | falk's | 1 |
| deb | 5 | dith's | 3 | drills | 2 | ealt | 12 | eels | 5 | ells | 7 | ers | 370 | fall | 28 |
| debt | 5 | dits | 2 | drin | 5 | ealth | 12 | eem | 33 | elm | 3 | er's | 1 | falls | 14 |
| dec | 10 | div | 2 | drink | 3 | ealths | 1 | eeme | 7 | elp | 9 | erse | 7 | fals | 5 |
| deck | 4 | dix | 1 | drinks | 2 | eam | 29 | eemes | 7 | elps | 2 | erst | 1 | false | 5 |
| decks | 2 | diz | 2 | dris | 4 | eams | 3 | eems | 14 | elps' | 1 | ert | 75 | fam | 19 |
| ded | 9 | dize | 1 | driv | 8 | ean | 46 | een | 277 | els | 37 | erth | 1 | fame | 2 |
| dee | 18 | dl | 9 | drive | 1 | eanc | 1 | eens | 1 | el's | 1 | erts | 7 | fan | 11 |
| deed | 3 | dle | 9 | dro | 18 | eance | 1 | een's | 1 | else | 4 | ert's | 2 | far | 41 |
| deem | 2 | dled | 2 | drom | 1 | eanne | 2 | eent | 2 | elsh | 5 | erv | 34 | farc | 6 |
| deep | 11 | do | 303 | drop | 2 | eans | 17 | eenth | 2 | elt | 5 | erve | 8 | farce | 6 |
| deer | 2 | doc | 16 | drops | 1 | ean's | 1 | eep | 37 | elv | 12 | erves | 4 | fare | 1 |
| def | 1 | dock | 3 | drou | 1 | eant | 8 | eeps | 2 | elve | 12 | es | 1927 | farm | 4 |
| deg | 2 | docks | 1 | droug | 1 |  |  | eer | 27 | elves | 12 | e's | 12 | farms | 1 |
| del | 40 | doe | 22 | drough | 1 |  |  | eers | 4 | em | 575 | ese | 66 | farn | 1 |
| dell | 2 | does | 22 | drought | 1 |  |  |  |  | eme | 21 |  |  |  |  |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| fas | 9 | file | 2 | flor | 5 | fri | 56 | ga | 266 | gio | 3 | gov | 31 | grum | 1 |
| fash | 4 | files | 1 | flow | 25 | fric | 1 | gag | 11 | gion | 3 | gow | 4 | gry | 2 |
| fast | 5 | fill | 11 | flu | 5 | fric | 37 | gage | 3 | gir | 35 | gown | 2 | gs | 60 |
| fat | 8 | fin | 49 | flus | 1 | fried | 4 | gai | 59 | girl | 34 | gowns | 2 | g's | 4 |
| fate | 5 | find | 11 | flush | 1 | frien | 33 | gain | 57 | girls | 21 | gr | 288 | gt | 15 |
| fau | 3 | fine | 11 | fly | 2 | friend | 33 | gains | 35 | gis | 7 | gra | 88 | gth | 15 |
| faul | 2 | fink | 3 | fo | 873 | friends | 24 | gainst | 35 | gist | 7 | grac | 7 | gths | 1 |
| fault | 2 | fir | 95 | fol | 36 | friend's | 1 | gal | 30 | git | 2 | grace | 5 | gu | 98 |
| faus | 1 | fire | 23 | fold | 1 | frig | 2 | gale | 3 | giv | 56 | grad | 4 | gua | 15 |
| faust | 1 | fires | 1 | folk | 3 | frigh | 2 | gales | 2 | give | 20 | grade | 1 | guag | 3 |
| fay | 2 | firm | 15 | folks | 1 | fright | 2 | gam | 14 | gives | 3 | grai | 2 | guage | 2 |
| fax | 7 | firms | 6 | fon | 7 | fris | 1 | game | 11 | giz | 1 | grain | 2 | guar | 12 |
| fe | 372 | firs | 54 | fond | 3 | fro | 275 | games | 3 | gize | 1 | gram | 2 | guard | 11 |
| fea | 29 | first | 54 | foo | 13 | froc | 2 | gan | 57 | gl | 54 | gran | 29 | gue | 31 |
| fear | 8 | fis | 9 | food | 6 | frock | 2 | gang | 6 | gla | 14 | grand | 14 | guel | 1 |
| feat | 3 | fisc | 2 | foot | 7 | frocks | 2 | gangs | 3 | glac | 4 | grang | 1 | guell | 1 |
| fee | 44 | fisch | 2 | for | 762 | from | 256 | gans | 2 | glace | 1 | grange | 1 | gues | 20 |
| fech | 1 | fish | 4 | force | 9 | fron | 15 | gant | 3 | glad | 2 | grant | 13 | guess | 4 |
| feet | 38 | fist | 1 | force | 9 | front | 14 | gants | 1 | glar | 1 | grap | 7 | guest | 14 |
| feets | 6 | fists | 1 | ford | 15 | fros | 1 | gar | 21 | glars | 1 | graph | 6 | guests | 12 |
| fed | 13 | fit | 17 | ford's | 1 | frost | 1 | garb | 1 | glas | 3 | graphs | 2 | gui | 12 |
| fee | 37 | fits | 2 | fore | 12 | frosts | 1 | gard | 10 | glass | 1 | gras | 2 | guid | 2 |
| feel | 13 | fitz | 4 | form | 46 | frow | 1 | gards | 1 | gle | 11 | grass | 2 | guide | 2 |
| feels | 2 | fiv | 1 | forms | 1 | frown | 1 | gars | 1 | glea | 1 | grat | 11 | guides | 2 |
| feet | 20 | five | 1 | fort | 39 | fru | 4 | gart | 1 | gled | 5 | grate | 2 | guil | 1 |
| fei | 3 | fix | 10 | forth | 5 | frui | 4 | garth | 1 | glen | 2 | grav | 11 | guis | 8 |
| feit | 2 | fl | 99 | forts | 5 | fruit | 4 | gas | 6 | gli | 17 | grave | 6 | guish | 7 |
| fel | 16 | fla | 20 | fos | 1 | fruits | 1 | gat | 22 | glid | 1 | graves | 1 | guir | 1 |
| fell | 6 | flag | 9 | foss | 1 | fry | 3 | gate | 15 | glim | 1 | gray | 2 | guire | 1 |
| felt | 2 | flagg | 1 | foug | 2 | frye | 3 | gates | 10 | glimp | 1 | gre | 131 | gul | 1 |
| fem | 2 | flags | 2 | fough | 2 | fs | 1 | gath | 6 | glimps | 1 | grea | 65 | gulf | 1 |
| fen | 12 | flam | 7 | fought | 2 | ft | 5 | gav | 10 | glin | 1 | great | 65 | gun | 9 |
| fend | 7 | flame | 6 | fou | 48 | fts | 1 | gave | 9 | gling | 1 | gree | 42 | guns | 2 |
| fends | 1 | flames | 6 | foun | 44 | fu | 123 | gaw | 1 | glis | 11 | greec | 4 | gus | 21 |
| fens | 5 | flan | 1 | found | 43 | fue | 1 | gay | 6 | glish | 9 | greece | 4 | gus' | 1 |
| fense | 5 | flas | 1 | foun | 1 | fuei | 1 | gaz | 2 | glit | 1 | greed | 6 | gust | 9 |
| fer | 99 | flash | 1 | four | 2 | fueil | 1 | ge | 191 | glo | 12 | greek | 3 | gusts | 1 |
| ferr | 5 | flat | 1 | fourt | 1 | ful | 64 | gea | 3 | glob | 1 | green | 7 | gy | 9 |
| fers | 2 | fle | 18 | fourth | 1 | full | 9 | gean | 3 | globe | 1 | grees | 3 | gyl | 1 |
| fert | 4 | flec | 2 | fox | 2 | fun | 8 | geanc | 1 | gloo | 1 | greet | 1 | gyle | 1 |
| ferts | 2 | flect | 1 | fr | 434 | fund | 7 | geance | 1 | gloom | 1 | greets | 1 | gym | 4 |
| fes | 21 | fled | 3 | fra | 40 | funds | 1 | geant | 2 | glov | 5 | greg | 2 |  |  |
| fe's | 5 | flee | 7 | frac | 4 | fur | 19 | ged | 14 | glove | 5 | gres | 9 | ha | 1912 |
| fess | 13 | fleec | 1 | frag | 2 | furs | 1 | gei | 1 | gloves | 4 | gret | 4 | haa | 1 |
| fest | 1 | fleet | 5 | frage | 2 | fus | 10 | gel | 14 | glow | 3 | gretc | 1 | haas | 1 |
| fet | 2 | flei | 1 | frai | 3 | fuse | 2 | gel's | 1 | glows | 2 | gretch | 1 | hab | 4 |
| fetc | 2 | fleis | 1 | fraid | 1 | fut | 1 | gem | 2 | gn | 50 | grets | 2 | hac | 2 |
| fetch | 2 | fleisc | 1 | frail | 1 | fy | 7 | gems | 1 | gns | 2 | grew | 4 | hack | 2 |
| feu | 2 | fleisch | 1 | fraiz | 1 |  |  | gen | 70 | go | 217 | gri | 9 | had | 158 |
| feur | 2 | fles | 1 | fraize | 1 |  |  | genc | 1 | goa | 3 | gril | 3 | hae | 6 |
| feurs | 2 | flet | 1 | fran | 21 |  |  | gence | 1 | goat | 3 | grill | 3 | hael | 5 |
| few | 20 | flete | 1 | franc | 1 |  |  | gene | 3 | goats | 2 | grim | 3 | haf | 4 |
| fey | 1 | fletch | 1 | france | 1 |  |  | gent | 5 | goe | 8 | grimm | 3 | haft | 2 |
| ff | 52 | flex | 1 | frank | 2 |  |  | gents | 3 | goes | 8 | grip | 2 | hafts | 1 |
| ffs | 1 | fli | 13 | frau | 2 |  |  | geo | 40 | gog | 2 | grips | 1 | hag | 5 |
| fft | 2 | flic | 3 | fraud | 2 |  |  | geof | 1 | gogu | 1 | gris | 1 | hah | 2 |
| fi | 316 | flict | 3 | frauds | 1 |  |  | geon | 4 | gogue | 1 | gro | 55 | hahl | 2 |
| fic | 32 | flie | 1 | fray | 1 |  |  | geons | 4 | gol | 5 | gros | 3 | hahl's | 1 |
| fice | 29 | flies | 1 | fre | 56 |  |  | geor | 35 | gold | 4 | gross | 1 | hai | 23 |
| fie | 21 | flig | 8 | fred | 18 |  |  | georg | 27 | golf | 1 | grot | 1 | hail | 1 |
| fiel | 18 | flight | 8 | free | 18 |  |  | george | 27 | gom | 1 | grou | 37 | hails | 1 |
| field | 18 | flin | 1 | freez | 2 |  |  | ger | 58 | gon | 13 | groun | 33 | hain | 3 |
| fields | 4 | flint | 1 | freeze | 1 |  |  | gers | 2 | gone | 12 | ground | 33 | haine | 2 |
| fier | 2 | flo | 41 | frei | 7 |  |  | gert | 1 | goo | 43 | grounds | 11 | haines | 2 |
| fierc | 2 | floa | 1 | freid | 1 |  |  | ges | 29 | good | 42 | group | 4 | hains | 1 |
| fierce | 2 | float | 1 | freig | 5 |  |  | gest | 13 | goods | 2 | grow | 12 | hair | 19 |
| fies | 1 | floo | 10 | freigh | 5 |  |  | get | 47 | gor | 7 | grown | 3 | hak | 4 |
| fif | 1 | flood | 4 | freight | 5 |  |  | geth | 11 | gorg | 1 | growt | 2 | hake | 4 |
| fig | 21 | floods | 2 | freights | 1 |  |  | gets | 5 | gorge | 1 | growth | 2 | hakes | 4 |
| figh | 10 | floor | 6 | fres | 5 |  |  | gg | 1 | gos | 7 | gru | 3 | hal | 61 |
| fight | 10 | floors | 2 | fresh | 5 |  |  | gh | 432 | got | 10 | grub | 2 | hale | 1 |
| fil | 21 |  |  | frey | 1 |  |  | gha | 1 | gott | 2 |  |  | half | 16 |
|  |  |  |  |  |  |  |  | ghas | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ghast | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ghe | 6 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ghes | 6 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ghs | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ght | 257 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ghts | 21 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ght's | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gi | 179 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gia | 9 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gian | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gie | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gif | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gift | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gifts | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gil | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gim | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gime | 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gin | 48 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gine | 11 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gines | 4 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | ging | 2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | gins | 5 |  |  |  |  |  |  |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| hall | 30 | hee | 10 | hill | 5 | holt | 4 | hroe | 2 | ides | 16 | ime | 115 | it | 1457 |
| halt | 6 | heck | 10 | hills | 1 | holz | 1 | hron | 4 | idg | 13 | imes | 20 | itc | 6 |
| halts | 1 | hecks | 2 | him | 100 | hom | 65 | hrong | 1 | idge | 11 | imm | 3 | itch | 6 |
| ham | 51 | hed | 14 | hin | 114 | home | 32 | hrongs | 1 | ids | 6 | imp | 2 | ite | 76 |
| hame | 5 | heds | 1 | hind | 8 | homes | 3 | hrou | 50 | idt | 2 | imps | 1 | ites | 8 |
| hames | 2 | hee | 9 | hine | 10 | homp | 1 | hroug | 50 | ie | 468 | in | 3844 | ite's | 2 |
| hamp | 3 | heed | 1 | hing | 65 | hon | 23 | hrough | 50 | iec | 1 | inc | 54 | ith | 350 |
| han | 156 | heel | 6 | hings | 14 | hone | 1 | hrow | 14 | iece | 1 | ince | 50 | ith's | 1 |
| hanc | 6 | heels | 3 | hink | 17 | hong | 3 | hrown | 8 | ied | 17 | inch | 2 | its | 106 |
| hance | 4 | heer | 2 | hinks | 5 | hons | 3 | hrows | 1 | ief | 31 | inct | 1 | itt | 9 |
| hand | 33 | hef | 4 | hins | 1 | honse | 3 | hry | 55 | ieg | 2 | ind | 60 | itts | 7 |
| hands | 12 | heft | 2 | hip | 51 | hoo | 38 | hrys | 55 | iege | 2 | inds | 6 | itz | 11 |
| hang | 28 | hei | 120 | hipp | 1 | hood | 7 | hs | 23 | ieh | 1 | ine | 111 | iv | 289 |
| hange | 15 | heig | 6 | hips | 9 | hook | 5 | h's | 8 | iehl | 1 | ines | 19 | ive | 118 |
| hanged | 3 | heigh | 6 | hir | 10 | hool | 23 | hs' | 1 | iel | 29 | ing | 1360 | ives | 28 |
| hant | 2 | height | 6 | hird | 2 | hools | 8 | ht | 246 | ield | 21 | ings | 45 | ix | 19 |
| hap | 27 | heights | 1 | hire | 3 | hoos | 1 | hts | 8 | ields | 4 | ing's | 3 | ixt | 1 |
| hape | 1 | heil | 2 | hirl | 3 | hoot | 2 | ht's | 1 | ien | 52 | ink | 29 | ixth | 1 |
| haps | 8 | heir | 112 | hirs | 1 | hop | 28 | hu | 130 | iend | 33 | inks | 7 | iz | 37 |
| har | 162 | hek | 1 | hirst | 1 | hope | 21 | hua | 2 | iends | 24 | inz | 1 | ize | 14 |
| hard | 17 | hel | 57 | his | 566 | hopes | 3 | hud | 10 | iend's | 1 | io | 912 |  |  |
| hare | 3 | held | 42 | hise | 2 | hops | 1 | hug | 8 | ient | 12 | ion | 884 | ja | 59 |
| harg | 40 | hell | 1 | hit | 27 | hor | 79 | hugh | 8 | ier | 26 | ions | 120 | jac | 9 |
| harge | 25 | helm | 1 | hite | 21 | hore | 8 | hughe | 6 | ierc | 2 | ior | 5 | jack | 9 |
| harl | 39 | help | 9 | hite's | 2 | hors | 16 | hughes | 6 | ierce | 2 | iou | 23 | jah | 1 |
| harle | 39 | helps | 2 | hith | 1 | horse | 10 | hul | 1 | iere | 1 | ious | 21 | jai | 7 |
| harles | 39 | helps' | 1 | hits | 1 | hort | 30 | hulk | 1 | ieres | 2 | ioux | 2 | jail | 7 |
| harm | 3 | hem | 77 | hiv | 2 | horts | 1 | hum | 3 | iers | 2 | ip | 123 | jam | 17 |
| harp | 2 | heme | 4 | hive | 1 | hos | 67 | humb | 1 | ierr | 1 | ipe | 3 | jame | 17 |
| harps | 1 | hemes | 1 | hiz | 2 | hose | 41 | hun | 15 | ierre | 1 | ipp | 2 | james | 17 |
| harpst | 1 | hemp | 1 | hize | 2 | host | 3 | hunk | 1 | ies | 168 | ippe | 1 | jan | 5 |
| hart | 6 | hen | 213 | hl | 5 | hosts | 1 | hunt | 7 | ieu | 4 | ips | 14 | jans | 1 |
| has | 254 | henc | 3 | hl's | 1 | hot | 12 | hur | 48 | iev | 45 | ipt | 3 | jap | 8 |
| hase | 1 | hence | 3 | hle | 2 | hou | 129 | hurc | 28 | ieve | 15 | iq | 1 | jar | 1 |
| hass | 3 | hend | 1 | hlet | 2 | houg | 41 | hurch | 28 | ieves | 1 | iqu | 3 | jaw | 2 |
| hast | 2 | hep | 3 | hm | 3 | hough | 41 | hurl | 1 | iew | 18 | ique | 3 | je | 50 |
| haste | 1 | heq | 1 | hme | 1 | hought | 9 | hurs | 9 | iews | 2 | ir | 182 | jea | 5 |
| hat | 663 | her | 434 | hmei | 1 | houghts | 1 | hurt | 4 | if | 200 | ird | 3 | jean | 5 |
| hate | 1 | herd | 1 | hmi | 2 | houl | 30 | hus | 17 | ife | 60 | irds | 1 | jeann | 2 |
| hatch | 1 | here | 226 | hmid | 2 | hould | 28 | hut | 5 | ife's | 5 | ire | 91 | jeanne | 2 |
| hau | 21 | heres | 1 | hmidt | 2 | hour | 34 | hute | 2 | iff | 18 | ires | 10 | jec | 15 |
| hauf | 14 | hers | 6 | hn | 69 | hours | 19 | hutt | 1 | ifft | 2 | ire's | 1 | ject | 15 |
| haus | 3 | herst | 1 | hne | 1 | hous | 23 | hy | 97 | ift | 6 | irk | 9 | jects | 2 |
| haust | 3 | hes | 65 | hnei | 1 | house | 15 | hyp | 3 | ifts | 1 | irk's | 2 | jef | 2 |
| haut | 3 | hese | 50 | hni | 1 | hout | 1 | hyps | 5 | ig | 372 | irl | 37 | jen | 1 |
| haute | 3 | hess | 1 | hnit | 1 | hov | 2 | hyx | 1 | igh | 244 | irls | 21 | jer | 7 |
| hav | 271 | hesse | 1 | hnitz | 1 | how | 91 |  |  | ighs | 1 | irm | 15 | jerg | 2 |
| have | 245 | het | 10 | hn's | 1 | howl | 1 | ia | 194 | ight | 189 | irms | 6 | jerge | 2 |
| havr | 1 | heth | 9 | ho | 827 | hown | 1 | iag | 15 | ights | 6 | irn | 1 | jes | 4 |
| havre | 1 | hey | 161 | hoa | 1 | hows | 11 | iage | 14 | ight's | 1 | irns | 1 | jet | 1 |
| haw | 16 | hi | 1350 | hoat | 1 | hoy | 3 | ial | 83 | igu | 50 | irs | 66 | jew | 15 |
| hawk | 14 | hia | 2 | hoate | 1 | hoyt | 3 | ials | 8 | igus | 2 | irst | 55 | jews | 1 |
| hay | 1 | hib | 9 | hoc | 3 | hr | 149 | iam | 13 | igs | 2 | irt | 5 | ji | 1 |
| hayn | 1 | hic | 230 | hock | 3 | hra | 2 | iams | 5 | ik | 38 | irth | 6 | jim | 1 |
| hayne | 1 | hich | 226 | hocks | 1 | hras | 1 | ian | 33 | ike | 38 | is | 1985 | jo | 149 |
| haynes | 1 | hick | 4 | hoe | 1 | hrase | 1 | ians | 3 | ikes | 1 | isc | 3 | job | 3 |
| haz | 1 | hid | 5 | hoen | 1 | hre | 13 | iant | 2 | il | 1005 | isch | 3 | jobs | 4 |
| he | 6112 | hide | 1 | hof | 3 | hrea | 8 | iar | 2 | ild | 60 | ise | 33 | joe | 4 |
| hea | 108 | hides | 1 | hoff | 1 | hreat | 8 | ib | 42 | ilds | 1 | ish | 123 | joh | 67 |
| head | 48 | hids | 1 | hog | 1 | hreats | 1 | ibe | 6 | ild's | 1 | isk | 2 | john | 67 |
| heads | 1 | hie | 26 | hoi | 2 | hres | 1 | ibes | 2 | ile | 110 | ism | 43 | john's | 1 |
| heal | 7 | hief | 16 | hoic | 2 | hresh | 1 | ic | 744 | iles | 12 | isms | 1 | joi | 5 |
| healt | 6 | hiev | 7 | hoice | 2 | hrey | 1 | ice | 168 | ilk | 3 | iso | 9 | join | 5 |
| health | 6 | hieve | 5 | hol | 76 | hri | 7 | ich | 257 | ill | 488 | ist | 79 | jol | 2 |
| heap | 5 | hieves | 1 | hold | 21 | hrif | 1 | ick | 54 | ille | 2 | iste | 1 | jor | 21 |
| hear | 39 | hig | 35 | holds | 1 | hrift | 1 | icks | 1 | illes | 1 | ists | 20 | jos | 1 |
| heard | 12 | high | 35 | hole | 29 | hril | 1 | ick's | 1 | ills | 9 |  |  | jost | 1 |
| hearn | 1 | hil | 85 | holes | 3 | hrill | 1 | ics | 22 | ils | 12 |  |  | jou | 16 |
| heart | 12 | hild | 15 | holl | 1 | hris | 5 | ict | 33 | ilt | 10 |  |  | jour | 16 |
| hearts | 3 | hilds | 1 | holm | 3 | hro | 72 | icts | 5 | im | 412 |  |  | journ | 7 |
| heat | 3 | hild's | 1 | holme | 3 | hroa | 2 | id | 371 | imb | 5 |  |  | jov | 1 |
| heav | 6 | hile | 36 | holmes | 3 | hroat | 2 | ide | 92 | imbs | 1 |  |  | jove | 1 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| joy | 21 | kir | 10 | lack | 10 | lds | 7 | lete | 24 | lit | 68 | loss | 9 | luxe | 1 |
| joyce | 3 | kirk | 9 | lad | 5 | ld's | 3 | lets | 3 | liv | 49 | lost | 19 | lv | 21 |
| joyce | 3 | kirk's | 2 | lade | 1 | le | 1399 | lett | 1 | live | 28 | lot | 21 | lve | 16 |
| joys | 2 | kirt | 1 | laf | 1 | lea | 137 | lette | 1 | lives | 11 | loth | 9 | lves | 12 |
| ju | 223 | kit | 4 | lag | 15 | lead | 35 | lev | 29 | liz | 3 | lothe | 3 | ly | 164 |
| jud | 19 | kite | 2 | lage | 5 | leads | 4 | leve | 25 | lk | 49 | lothes | 2 | lyn | 8 |
| judg | 19 | kites | 1 | lagg | 1 | leag | 6 | lew | 4 | lks | 11 | lotz | 1 | lyne | 2 |
| judge | 15 | kl | 2 | lags | 2 | leagu | 6 | lex | 5 | lk's | 13 | lou | 19 | lynch | 2 |
| judges | 9 | klo | 2 | lah | 1 | league | 6 | ley | 50 | ll | 919 | loud | 1 | lyz | 1 |
| jug | 1 | klop | 1 | lai | 56 | leagues | 1 | leyn | 1 | lla | 1 | loug | 1 | lz | 1 |
| jum | 7 | klopp | 1 | laid | 3 | lean | 9 | lf | 60 | lle | 3 | lough | 1 | | |
| jump | 7 | klot | 1 | laim | 25 | leans | 2 | lfe | 1 | lles | 1 | lour | 2 | ma | 833 |
| jumps | 1 | klotz | 1 | laims | 8 | leap | 4 | lft | 2 | llo | 2 | lourd | 2 | mac | 4 |
| jun | 28 | kn | 71 | lain | 25 | leaps | 1 | lfth | 2 | lloy | 2 | lourde | 2 | mack | 1 |
| june | 27 | kna | 8 | laine | 1 | lear | 22 | lge | 2 | lloyd | 2 | lourdes | 2 | mad | 100 |
| jur | 25 | knap | 8 | lains | 2 | learn | 13 | li | 706 | lls | 42 | lous | 6 | made | 90 |
| jus | 50 | knapp | 8 | laint | 9 | leas | 36 | lia | 25 | lm | 19 | lov | 15 | mag | 10 |
| just | 36 | knapp's | 1 | laints | 3 | lease | 2 | liam | 13 | lme | 3 | love | 11 | mai | 53 |
| | | kne | 6 | lak | 22 | least | 16 | liams | 5 | lmes | 3 | loves | 4 | maid | 3 |
| ka | 26 | knea | 1 | lake | 22 | leat | 1 | lib | 9 | lms | 3 | low | 88 | mail | 5 |
| kai | 1 | knead | 1 | lakes | 8 | leath | 1 | lic | 94 | lo | 629 | lows | 7 | main | 45 |
| kal | 2 | knee | 1 | lam | 11 | leau | 3 | lice | 52 | loa | 12 | loy | 4 | maine | 1 |
| kall | 2 | knew | 4 | lame | 7 | leaux | 3 | lich | 1 | load | 9 | loyd | 2 | mains | 5 |
| kan | 9 | kni | 2 | lames | 6 | leav | 20 | lict | 3 | loan | 2 | loz | 1 | mak | 49 |
| kane | 2 | knig | 2 | lan | 142 | leave | 13 | lid | 4 | loat | 1 | lp | 13 | make | 49 |
| kar | 1 | knigh | 2 | lanc | 9 | leaves | 3 | lide | 1 | lob | 1 | lph | 1 | makes | 9 |
| kat | 1 | knight | 2 | lance | 4 | lec | 70 | lie | 76 | lobe | 1 | lps | 2 | mal | 30 |
| kath | 1 | knight's | 1 | lanch | 4 | lect | 4 | lied | 1 | loc | 53 | lp's | 1 | male | 2 |
| ke | 264 | kno | 55 | lanche | 1 | led | 43 | lief | 12 | loch | 1 | lps' | 1 | mall | 10 |
| kea | 1 | knoc | 3 | land | 75 | ledg | 8 | leir | 3 | lock | 50 | ls | 159 | mals | 2 |
| kead | 1 | knock | 3 | lands | 1 | ledge | 4 | liere | 1 | locke | 1 | ls' | 2 | man | 189 |
| ked | 1 | knocks | 1 | land's | 2 | lee | 24 | lieres | 1 | locks | 5 | l's | 3 | manc | 2 |
| kee | 20 | knot | 1 | lane | 6 | leec | 1 | lies | 10 | lod | 4 | lse | 9 | mance | 2 |
| keef | 1 | know | 50 | lank | 2 | leece | 1 | lieu | 4 | lodg | 4 | lsh | 5 | mand | 19 |
| keefe | 1 | knowl | 5 | lans | 7 | leep | 6 | liev | 38 | lodge | 4 | lt | 83 | mands | 6 |
| keel | 1 | known | 17 | lant | 14 | leer | 1 | lieve | 10 | lof | 2 | lth | 12 | mann | 10 |
| keen | 1 | knows | 6 | lants | 1 | lees | 10 | lif | 31 | loff | 1 | lths | 1 | man's | 8 |
| keep | 16 | knox | 1 | lap | 3 | leet | 5 | life | 26 | log | 2 | lts | 7 | map | 2 |
| keeps | 1 | ko | 3 | laps | 1 | leev | 1 | lift | 1 | loi | 3 | ltz | 1 | mar | 79 |
| kel | 4 | koa | 1 | lar | 113 | leeve | 1 | lig | 37 | loin | 1 | lu | 139 | marc | 4 |
| kell | 1 | koac | 1 | lard | 1 | lef | 36 | ligh | 35 | lois | 1 | lub | 32 | march | 4 |
| ken | 68 | koach | 1 | lare | 6 | left | 32 | light | 35 | loit | 1 | luc | 3 | mark | 20 |
| kens | 1 | koe | 2 | lares | 3 | leg | 37 | lights | 3 | loits | 1 | luck | 2 | marks | 2 |
| kep | 6 | koer | 1 | larg | 31 | lege | 6 | lik | 33 | lom | 1 | lud | 14 | mars | 3 |
| kept | 6 | kr | 6 | large | 23 | lei | 2 | like | 33 | lon | 146 | lude | 5 | marsh | 1 |
| ker | 12 | kra | 1 | lark | 4 | leis | 1 | lil | 5 | lone | 16 | ludes | 2 | mas | 18 |
| kern | 1 | kran | 1 | larm | 3 | leisc | 1 | lim | 26 | long | 90 | lue | 10 | mash | 1 |
| kers | 6 | krane | 1 | larms | 1 | leisch | 1 | limb | 5 | longe | 1 | luf | 1 | mass | 8 |
| kes | 32 | kranes | 1 | lars | 12 | lel | 7 | limbs | 1 | longs | 1 | luff | 1 | masse | 1 |
| ket | 4 | kre | 5 | las | 108 | lem | 6 | limp | 2 | loo | 46 | lum | 13 | mast | 1 |
| kete | 3 | kreh | 1 | lash | 1 | len | 40 | limps | 1 | lood | 4 | lumb | 1 | mat | 14 |
| ketch | 3 | krei | 2 | lass | 11 | lenc | 2 | lin | 77 | loods | 2 | lume | 1 | matč | 2 |
| keu | 2 | kreit | 2 | last | 84 | lence | 2 | lind | 4 | look | 26 | lumes | 1 | match | 2 |
| key | 1 | kreitz | 2 | lasts | 1 | lene | 2 | line | 31 | looks | 5 | lums | 1 | mate | 9 |
| ki | 151 | kri | 1 | lat | 44 | leng | 13 | lines | 9 | loom | 3 | lun | 6 | mates | 1 |
| kie | 3 | kris | 1 | late | 27 | lengt | 12 | ling | 17 | looms | 1 | lunc | 3 | math | 1 |
| kick | 3 | krish | 1 | lates | 1 | length | 12 | ling's | 2 | loon | 2 | lunch | 3 | mau | 11 |
| kicks | 1 | kro | 1 | lau | 13 | lengths | 1 | lins | 1 | loons | 1 | lung | 1 | maud | 2 |
| kil | 42 | kron | 1 | lauf | 1 | lent | 6 | lint | 1 | loor | 6 | lunge | 1 | maul | 1 |
| kill | 35 | ks | 100 | laug | 4 | lep | 1 | lio | 2 | loors | 2 | lup | 1 | maur | 1 |
| kills | 4 | k's | 5 | laugh | 4 | lept | 2 | lion | 2 | loos | 4 | lur | 5 | max | 5 |
| kim | 1 | ku | 11 | laun | 2 | ler | 79 | lip | 10 | loose | 2 | lure | 1 | may | 83 |
| kin | 88 | kuk | 2 | launc | 2 | lerk | 28 | lips | 2 | loot | 1 | lurch | 1 | maz | 1 |
| kinc | 1 | kul | 4 | launch | 2 | lerks | 13 | liq | 8 | lop | 1 | lure | 1 | mb | 10 |
| kinch | 1 | kull | 4 | law | 15 | lerk's | 1 | lis | 56 | lopp | 1 | lurk | 2 | mbs | 2 |
| kind | 48 | kus | 5 | lawn | 2 | lers | 2 | lish | 34 | lor | 37 | lus | 13 | mc | 37 |
| kinds | 3 | ky | 5 | laws | 7 | lert | 4 | liss | 1 | lord | 12 | lush | 1 | me | 1239 |
| king | 55 | | | lay | 38 | les | 173 | list | 11 | lord's | 1 | lust | 1 | mea | 37 |
| king's | 1 | la | 832 | lays | 2 | less | 47 | lists | 3 | lore | 2 | lut | 6 | meal | 2 |
| kings | 1 | lab | 9 | lc | 1 | lest | 3 | | | lors | 2 | lute | 5 | mean | 23 |
| kink | 1 | lac | 80 | lch | 1 | let | 77 | | | los | 63 | lutz | 1 | means | 14 |
| kins | 4 | lace | 43 | ld | 424 | letc | 1 | | | lose | 12 | lux | 3 | meant | 3 |
| | | | | | | letch | 1 | | | | | | | | |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| meas | 11 | mith | 4 | mur | 35 | nence | 1 | nock | 3 | nurs | 1 | oines | 1 | ooms | 5 |
| meat | 1 | mith's | 1 | mus | 35 | nent | 18 | nocks | 1 | nus | 2 | oint | 55 | oon | 66 |
| med | 32 | mits | 4 | muse | 2 | nents | 3 | nod | 1 | nx | 2 | oints | 3 | oons | 3 |
| mee | 26 | mix | 2 | must | 31 | nep | 1 | noe | 3 | ny | 98 | oir | 4 | oor | 30 |
| meet | 26 | mm | 3 | muz | 1 | neph | 1 | noen | 3 | ny's | 6 | oire | 4 | oore | 2 |
| mei | 1 | mn | 9 | my | 66 | ner | 63 | nof | 1 | nz | 2 | ois | 7 | oors | 9 |
| mel | 6 | mn's | 2 | myr | 1 | ners | 8 | noff | 1 | nze | 1 | oise | 2 | oos | 15 |
| mell | 2 | mo | 641 | mys | 6 | nerv | 2 | nog | 2 | | | oit | 8 | oose | 10 |
| mells | 1 | moc | 7 | na | 312 | nerve | 2 | noi | 7 | oa | 119 | oits | 1 | oost | 2 |
| melt | 1 | mock | 6 | nab | 1 | nerves | 2 | noin | 2 | oac | 5 | ok | 94 | oot | 15 |
| mem | 59 | mocks | 2 | nac | 2 | ne's | 2 | noint | 2 | oach | 5 | oke | 8 | ooth | 1 |
| men | 389 | mod | 15 | nach | 1 | nes | 124 | nois | 5 | oad | 54 | oks | 9 | oots | 1 |
| menc | 2 | mode | 1 | nai | 3 | nese | 7 | noise | 1 | oads | 11 | ol | 418 | oots' | 1 |
| mence | 1 | moi | 2 | nail | 2 | ness | 67 | nol | 2 | oak | 2 | old | 100 | op | 209 |
| mend | 24 | moin | 1 | nair | 1 | nest | 3 | nom | 16 | oal | 6 | olds | 1 | ope | 25 |
| mends | 3 | moine | 1 | nal | 46 | nett | 4 | non | 15 | oam | 1 | ole | 40 | opes | 8 |
| menn | 4 | moines | 1 | nals | 1 | nette | 3 | none | 7 | oan | 2 | oles | 3 | oph | 2 |
| mens | 4 | moir | 1 | nam | 42 | neu | 4 | noo | 42 | oar | 22 | olf | 1 | opp | 1 |
| men's | 6 | moire | 1 | name | 31 | nev | 32 | noon | 40 | oard | 20 | olk | 3 | ops | 14 |
| mense | 4 | mok | 2 | names | 8 | new | 185 | noos | 2 | oards | 2 | olks | 1 | opt | 10 |
| ment | 223 | moke | 2 | nan | 17 | news | 39 | noose | 2 | oars | 1 | oll | 18 | or | 2176 |
| ments | 45 | mon | 191 | nanc | 3 | nex | 29 | nop | 1 | oarse | 1 | olls | 3 | orb | 1 |
| mer | 102 | mond | 22 | nance | 2 | next | 27 | nor | 73 | oas | 8 | olm | 12 | orc | 12 |
| merc | 1 | monds | 8 | nand | 1 | ney | 23 | nore | 2 | oast | 8 | olme | 3 | orce | 9 |
| merce | 1 | mong | 29 | nant | 3 | ney's | 5 | nors | 2 | oasts | 1 | olmes | 3 | ord | 71 |
| mere | 7 | mons | 10 | nap | 11 | nez | 1 | nort | 28 | oat | 19 | ols | 8 | ords | 6 |
| merg | 1 | mont | 39 | napp | 8 | ng | 1623 | north | 28 | oate | 2 | olt | 11 | ord's | 2 |
| mers | 2 | month | 32 | napp's | 1 | nge | 39 | north's | 1 | oates | 1 | olv | 7 | ore | 120 |
| mes | 76 | months | 13 | naps | 1 | nged | 3 | nos | 2 | oats | 5 | olve | 2 | ores | 5 |
| mesh | 1 | month's | 1 | nar | 8 | ngs | 53 | nose | 1 | ob | 109 | olz | 1 | orf | 1 |
| met | 15 | months' | 1 | nard | 3 | ng's | 3 | not | 268 | obe | 1 | om | 945 | org | 28 |
| meth | 6 | moo | 7 | nas | 4 | ngt | 15 | note | 3 | obs | 1 | omb | 3 | orge | 28 |
| mett | 1 | moor | 5 | nat | 6 | ngth | 15 | noth | 20 | oc | 148 | ombs | 1 | ork | 165 |
| metz | 1 | moore | 2 | nate | 2 | ngths | 1 | notr | 1 | och | 27 | ome | 206 | orks | 5 |
| mev | 1 | moors | 2 | nau | 1 | ngu | 1 | notre | 1 | oche | 2 | omes | 9 | orl | 21 |
| mex | 12 | moot | 2 | naug | 1 | ni | 264 | nou | 40 | ock | 83 | omp | 6 | orld | 21 |
| mey | 5 | mooth | 1 | naugh | 1 | nia | 7 | noug | 15 | ocke | 1 | ompt | 2 | orlds | 1 |
| mez | 1 | mor | 175 | naught | 1 | nic | 16 | nough | 15 | ocks | 16 | oms | 9 | orld's | 2 |
| mi | 369 | more | 75 | nav | 4 | nice | 2 | nought | 1 | od | 169 | on | 2859 | orm | 51 |
| mic | 9 | morn | 31 | nay | 1 | nich | 6 | noughts | 1 | odd | 1 | onc | 16 | orms | 5 |
| mice | 2 | mors | 1 | nc | 324 | nick | 3 | noun | 21 | ode | 3 | once | 16 | orn | 49 |
| mich | 6 | mos | 72 | nce | 254 | nie | 13 | nounc | 21 | odg | 4 | ond | 45 | orp | 8 |
| mick | 1 | most | 68 | nch | 22 | nier | 1 | nour | 1 | odge | 4 | onds | 9 | orps | 1 |
| mid | 18 | mot | 21 | nche | 1 | nies | 10 | nous | 3 | ods | 13 | one | 210 | orpse | 2 |
| midt | 2 | moth | 21 | nct | 1 | nif | 3 | nov | 8 | oe | 50 | ones | 4 | ors | 99 |
| mie | 4 | mou | 41 | nd | 2001 | nig | 62 | now | 113 | oen | 5 | one's | 2 | orse | 12 |
| mier | 2 | moun | 37 | nds | 108 | nigh | 61 | nowl | 5 | oer | 1 | ong | 143 | orst | 2 |
| mies | 2 | mount | 22 | nd's | 3 | night | 61 | nown | 17 | oes | 32 | onge | 1 | ort | 178 |
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| migh | 30 | mour | 1 | nea | 57 | nil | 1 | nox | 1 | oetz | 1 | ongu | 1 | orth's | 1 |
| might | 30 | mout | 3 | nead | 1 | nin | 56 | ns | 369 | oeu | 1 | ons | 92 | orts | 20 |
| mil | 82 | mouth | 3 | near | 50 | nine | 5 | n's | 34 | oeur | 1 | on's | 1 | os | 411 |
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| mill | 5 | mow | 1 | neck | 3 | nior | 2 | nt | 883 | og | 28 | onths | 13 | ost | 119 |
| mills | 1 | mp | 72 | nect | 3 | nip | 2 | nth | 34 | ogr | 1 | onth's | 1 | osts | 2 |
| min | 69 | mps | 4 | ned | 9 | nips | 1 | nths | 13 | ogre | 1 | onths' | 1 | ot | 582 |
| minc | 2 | mpt | 25 | nee | 14 | nis | 11 | nth's | 1 | ogs | 2 | onz | 1 | otc | 1 |
| mince | 2 | mpts | 1 | need | 7 | nish | 9 | nths' | 1 | ogu | 2 | onze | 1 | otch | 1 |
| mind | 8 | ms | 84 | needs | 1 | nit | 2 | nts | 109 | ogue | 2 | oo | 353 | ote | 39 |
| minds | 1 | m's | 1 | neer | 6 | nits | 1 | nu | 87 | ogues | 1 | ooc | 1 | otes | 14 |
| mine | 5 | mu | 136 | neers | 2 | nitz | 1 | nuc | 1 | oh | 68 | ooch | 1 | oth | 199 |
| ming | 8 | muc | 39 | neg | 5 | nix | 1 | nuch | 1 | ohn | 67 | ood | 78 | othe | 3 |
| mings | 1 | much | 39 | nei | 16 | niz | 6 | nue | 14 | ohn's | 1 | oods | 5 | othes | 2 |
| mir | 2 | mud | 2 | neig | 12 | nk | 68 | nug | 1 | oi | 119 | oof | 6 | oths | 3 |
| mirt | 1 | mug | 1 | neigh | 12 | nks | 9 | nui | 1 | oic | 24 | ook | 64 | otr | 1 |
| mirth | 1 | mul | 1 | nel | 15 | nn | 28 | nul | 6 | oice | 17 | ooke | 1 | otre | 1 |
| mis | 59 | mum | 8 | nels | 2 | nne | 3 | num | 33 | oid | 7 | ooks | 9 | ots | 7 |
| mise | 2 | mun | 4 | nen | 20 | no | 755 | nun | 8 | oil | 4 | ool | 35 | ots' | 3 |
| miss | 8 | mund | 3 | nene | 1 | noc | 4 | nung | 2 | oin | 63 | ools | 8 | ott | 4 |
| mit | 63 | | | | | | | nur | 1 | oine | 1 | oom | 23 | otz | 1 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ou | 1366 | page | 17 | pell | 4 | pils | 1 | plough | 1 | preac | 5 | pth | 1 | quote | 4 |
| oub | 26 | pai | 37 | pen | 115 | pin | 52 | ploy | 19 | preach | 5 | pts | 1 | quotes | 1 |
| oubt | 17 | paid | 9 | pend | 24 | pine | 1 | plu | 8 | pread | 1 | pu | 158 | | |
| oubts | 1 | paig | 10 | pends | 5 | ping | 8 | plum | 3 | prec | 5 | pub | 62 | ra | 740 |
| ouc | 4 | paigu | 10 | penn | 7 | pink | 1 | plumb | 1 | pred | 2 | pul | 6 | rab | 3 |
| ouch | 4 | pain | 6 | pens | 11 | pip | 1 | plume | 1 | pref | 2 | pull | 3 | rac | 55 |
| oud | 6 | pains | 1 | pense | 3 | pipe | 1 | plumes | 1 | prem | 3 | pum | 5 | race | 11 |
| oug | 159 | paint | 2 | pent | 7 | pir | 30 | plums | 1 | preme | 2 | pump | 5 | rack | 10 |
| ough | 157 | paints | 1 | peo | 46 | pire | 13 | plun | 3 | prep | 4 | pumps | 1 | racks | 2 |
| ought | 52 | pair | 12 | per | 200 | pires | 3 | plung | 1 | pres | 125 | pun | 6 | ract | 26 |
| oughts | 2 | pairs | 1 | pers | 28 | pis | 3 | plunge | 1 | press | 54 | pur | 33 | racts | 4 |
| oul | 179 | pal | 25 | pert | 2 | pit | 19 | ply | 23 | pret | 7 | pure | 1 | rad | 19 |
| ould | 174 | pals | 2 | pes | 9 | pitch | 1 | po | 406 | pri | 156 | purg | 1 | rade | 9 |
| oun | 304 | pam | 2 | pest | 1 | pite | 10 | poc | 5 | pric | 8 | purge | 1 | rades | 2 |
| ounc | 21 | pan | 18 | pet | 17 | pitt | 7 | pock | 2 | price | 8 | purs | 1 | rac | 1 |
| ound | 123 | pans | 1 | pew | 1 | pitts | 7 | poi | 55 | prid | 3 | pus | 1 | raf | 9 |
| ounds | 22 | pant | 2 | pey | 1 | pl | 375 | poil | 1 | pride | 3 | put | 35 | raft | 3 |
| oung | 31 | pants | 2 | ph | 96 | pla | 145 | poin | 53 | prie | 2 | pute | 2 | rafts | 1 |
| ount | 40 | par | 168 | pha | 6 | plac | 57 | point | 53 | pries | 2 | puts | 1 | rag | 16 |
| ounts | 6 | pare | 1 | phal | 3 | place | 36 | points | 3 | pril | 1 | puz | 2 | rage | 3 |
| oup | 13 | pares | 1 | phalt | 3 | plai | 22 | pois | 1 | prim | 1 | py | 6 | rags | 1 |
| oups | 3 | park | 5 | phe | 11 | plain | 22 | poise | 1 | prime | 1 | | | rai | 91 |
| our | 213 | parks | 1 | phel | 2 | plains | 2 | pok | 1 | prin | 50 | qu | 151 | raid | 2 |
| ource | 6 | part | 50 | phelp | 2 | plaint | 9 | poke | 1 | princ | 12 | qua | 41 | raids | 1 |
| ourd | 2 | paris | 3 | phelps | 2 | plaints | 3 | pol | 38 | prince | 12 | quad | 5 | raig | 3 |
| ourde | 2 | pas | 37 | phelps' | 1 | plan | 39 | pole | 4 | pring | 8 | quads | 1 | raigh | 3 |
| ourdes | 2 | pass | 24 | phen | 1 | planc | 1 | poll | 2 | prings | 2 | quai | 3 | raight | 3 |
| ourg | 1 | past | 10 | pher | 6 | planch | 1 | polls | 2 | print | 4 | quain | 3 | rail | 23 |
| ourn | 7 | pat | 19 | phere | 1 | plane | 4 | pom | 2 | prinz | 1 | quaint | 3 | rails | 1 |
| ours | 38 | pate | 5 | pheres | 1 | plank | 1 | pon | 28 | pris | 34 | quak | 1 | rain | 43 |
| ourse | 17 | patch | 5 | phers | 1 | plans | 7 | pond | 4 | prise | 7 | quake | 1 | raine | 1 |
| ourt | 62 | pate | 4 | phi | 29 | plant | 12 | pone | 1 | priv | 7 | qual | 9 | raines | 1 |
| ourth | 1 | pates | 2 | phia | 2 | plants | 1 | pons | 3 | priz | 2 | quan | 2 | rains | 4 |
| ourts | 11 | path | 1 | phil | 10 | plas | 1 | ponse | 2 | pro | 275 | quar | 18 | raint | 2 |
| ourt's | 1 | pau | 9 | phl | 2 | play | 9 | poo | 12 | proa | 2 | quare | 1 | rais | 4 |
| ous | 148 | paul | 8 | phle | 2 | plays | 2 | pool | 5 | proac | 2 | quart | 1 | raise | 3 |
| ouse | 16 | paul's | 1 | phlet | 2 | ple | 149 | poor | 7 | proach | 2 | quarts | 1 | raiz | 1 |
| out | 258 | paus | 1 | pho | 6 | plea | 18 | pop | 23 | prob | 28 | quat | 1 | raize | 1 |
| oute | 4 | pav | 11 | phon | 4 | plead | 2 | pope | 1 | proc | 1 | quate | 1 | rak | 1 |
| outh | 34 | pave | 9 | phone | 1 | pleas | 16 | por | 80 | prod | 3 | que | 58 | rake | 1 |
| outs | 2 | pay | 42 | phons | 3 | please | 2 | pork | 1 | prof | 1 | quec | 4 | ral | 21 |
| ov | 163 | payn | 7 | phonse | 3 | pled | 8 | port | 59 | prog | 7 | queen | 4 | ralp | 1 |
| ove | 47 | payne | 6 | phr | 5 | pledg | 6 | ports | 12 | progr | 1 | queen's | 1 | ralph | 1 |
| oves | 10 | pays | 1 | phra | 2 | pledge | 3 | pos | 118 | progre | 1 | quel | 1 | ram | 5 |
| ow | 542 | pe | 698 | phras | 1 | plen | 5 | pose | 8 | prom | 24 | quele | 1 | ramp | 1 |
| owel | 13 | pea | 67 | phrase | 1 | ples | 6 | post | 6 | promp | 2 | quel·h | 1 | ran | 138 |
| owels | 3 | peac | 5 | phre | 3 | plet | 21 | pot | 8 | prompt | 2 | quen | 11 | rane | 16 |
| owe | 2 | peace | 1 | phrey | 1 | plete | 24 | pots | 1 | proo | 3 | quene | 4 | rance | 12 |
| owes | 1 | peach | 4 | phs | 2 | plex | 4 | pou | 15 | proof | 3 | quence | 4 | ranch | 1 |
| owl | 7 | peak | 9 | ph's | 1 | pli | 24 | poul | 8 | prop | 35 | quent | 5 | rand | 15 |
| own | 135 | peal | 6 | phy | 21 | plic | 4 | poun | 9 | proph | 2 | quer | 4 | rane | 2 |
| owns | 3 | peals | 1 | phys | 4 | plice | 2 | pound | 9 | pros | 8 | ques | 30 | ranes | 1 |
| ows | 29 | pear | 41 | phyx | 1 | plie | 2 | pounds | 8 | prose | 1 | quest | 4 | rang | 29 |
| ow's | 3 | peare | 3 | pi | 206 | plies | 2 | pour | 3 | prou | 4 | quests | 1 | range | 22 |
| owt | 2 | peare's | 1 | pic | 20 | plig | 1 | pous | 1 | proud | 3 | quet | 2 | rank | 11 |
| owth | 2 | pearl | 5 | pice | 1 | pligh | 1 | pouse | 1 | prov | 35 | qui | 45 | ranks | 1 |
| ox | 18 | pears | 6 | pick | 4 | plight | 1 | pov | 4 | prove | 18 | quic | 6 | rans | 6 |
| oy | 106 | peas | 5 | pict | 1 | plin | 3 | pow | 13 | proves | 5 | quick | 6 | rant | 25 |
| oye | 3 | pease | 2 | picts | 1 | pling | 1 | pp | 19 | prox | 1 | quin | 2 | rants | 4 |
| oyce | 3 | peat | 1 | pid | 1 | plis | 4 | ppe | 1 | pru | 5 | quinn | 2 | rap | 26 |
| oyd | 2 | peats | 1 | pie | 12 | plish | 4 | pp's | 1 | prun | 2 | quip | 2 | raph | 6 |
| oye | 6 | pec | 44 | piec | 1 | plit | 1 | pr | 695 | prune | 1 | quir | 8 | raphs | 2 |
| oys | 18 | peck | 1 | piece | 1 | plo | 26 | pra | 23 | prunes | 1 | quire | 4 | rapp | 7 |
| oy's | 1 | pect | 34 | pied | 7 | ploi | 1 | prac | 13 | prung | 1 | quis | 1 | raps | 1 |
| oyt | 3 | pects | 4 | pier | 1 | ploit | 1 | prai | 7 | prus | 3 | quise | 1 | rar | 2 |
| oz | 8 | ped | 24 | pierr | 1 | ploits | 1 | prais | 5 | ps | 57 | quit | 10 | rard | 1 |
| pa | 518 | pee | 11 | pierre | 1 | plor | 3 | praise | 3 | p's | 2 | quite | 9 | rare | 1 |
| pac | 9 | peec | 6 | pies | 2 | plore | 2 | pran | 1 | pse | 2 | quith | 1 | ras | 13 |
| pace | 1 | peech | 6 | pik | 1 | plot | 2 | prang | 1 | pst | 1 | quo | 7 | rase | 1 |
| pack | 3 | peed | 4 | pike | 1 | plou | 1 | pray | 2 | pt | 80 | quor | 1 | rash | 1 |
| pag | 20 | peer | 1 | pil | 4 | ploug | 1 | pre | 236 | | | quors | 1 | rass | 6 |
| | | pel | 8 | pile | 1 | | | prea | 6 | | | quot | 6 | rast | 2 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| rat | 76 | ref | 4 | rict | 12 | rm | 101 | rosse | 1 | run | 39 | save | 6 | scratch | 2 |
| rate | 2 | reg | 20 | riets | 1 | rms | 24 | rost | 1 | runc | 1 | saw | 17 | scraw | 1 |
| ratch | 2 | reh | 1 | rid | 33 | rn | 224 | rosts | 1 | runch | 1 | sax | 1 | scrawl | 1 |
| rate | 35 | rei | 19 | ride | 4 | rne | 2 | rot | 23 | rune | 1 | saxe | 1 | scre | 3 |
| rates | 6 | reic | 2 | ridg | 12 | rnes | 1 | rote | 3 | runes | 1 | say | 76 | screa | 1 |
| rath | 5 | reick | 2 | ridge | 10 | rns | 8 | roth | 16 | rung | 1 | sayl | 2 | scream | 1 |
| rats | 8 | reid | 1 | rids | 1 | ro | 1168 | roths | 3 | runk | 4 | sayle | 2 | screams | 1 |
| rau | 3 | reig | 7 | rie | 114 | roa | 53 | rou | 166 | runks | 1 | sayles | 2 | scree | 1 |
| raud | 2 | reigh | 5 | ried | 20 | roac | 4 | roub | 5 | runs | 1 | says | 42 | screen | 1 |
| rauds | 1 | reight | 5 | rief | 3 | roach | 4 | roud | 3 | rup | 10 | sc | 120 | screens | 1 |
| rav | 24 | reights | 1 | rien | 35 | road | 45 | roug | 77 | rupp | 1 | sca | 9 | screw | 1 |
| rave | 7 | reign | 2 | riend | 33 | roads | 11 | rough | 77 | rupt | 9 | scal | 3 | screws | 1 |
| raves | 1 | rein | 1 | riends | 24 | roam | 1 | rought | 26 | rus | 36 | scale | 1 | scri | 13 |
| raw | 8 | reit | 2 | riend's | 1 | roar | 1 | roun | 53 | rush | 6 | scalp | 2 | scrib | 6 |
| rawl | 1 | reitz | 2 | ries | 45 | roat | 2 | round | 53 | rust | 8 | scan | 1 | scribe | 4 |
| rawn | 3 | rel | 13 | rif | 2 | rob | 53 | rounds | 12 | rusts | 2 | scar | 3 | scribes | 2 |
| ray | 14 | rell | 2 | rife | 1 | roc | 22 | roup | 7 | rut | 7 | scare | 1 | scrip | 7 |
| rays | 1 | rels | 3 | rift | 1 | roch | 9 | roups | 3 | rute | 1 | scares | 1 | script | 2 |
| rb | 7 | rem | 18 | rig | 40 | roche | 2 | rour | 1 | ruth | 6 | scarf | 1 | scru | 7 |
| rbs | 2 | reme | 40 | righ | 30 | rock | 12 | rous | 6 | rux | 1 | scat | 2 | scrub | 2 |
| rc | 78 | ren | 57 | right | 27 | rocks | 6 | rout | 9 | rv | 37 | sce | 17 | scu | 3 |
| rcc | 18 | renc | 6 | rights | 1 | rod | 5 | route | 4 | rve | 9 | scen | 15 | scur | 1 |
| rch | 49 | rence | 6 | ri's | 1 | rode | 1 | rov | 36 | rves | 4 | scend | 4 | scure | 1 |
| rd | 237 | rend | 1 | rik | 4 | roe | 6 | rove | 19 | ry | 380 | scends | 1 | se | 1076 |
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| rds | 25 | rength | 3 | ril | 18 | rogr | 1 | rowd | 13 | rys | 55 | scep | 2 | seam | 4 |
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| reac | 25 | ren's | 2 | rime | 8 | rogues | 1 | rows | 1 | saac | 1 | schem | 4 | seas | 5 |
| reach | 25 | rep | 37 | rimes | 1 | roi | 8 | row's | 3 | sac | 9 | scheme | 3 | sea's | 1 |
| read | 46 | req | 1 | rimm | 3 | roid | 1 | rowt | 2 | sack | 5 | schen | 1 | seat | 2 |
| reak | 8 | rer | 3 | rin | 89 | roit | 7 | rowth | 2 | sacq | 1 | schm | 3 | sec | 25 |
| real | 11 | rer's | 1 | rinc | 12 | rok | 4 | rox | 1 | sacqu | 1 | schme | 1 | see | 88 |
| realm | 1 | res | 273 | rince | 12 | roke | 4 | roy | 22 | sacque | 1 | schmei | 1 | seed | 2 |
| realms | 1 | re's | 2 | rine | 11 | rol | 23 | rp | 6 | sad | 3 | schmi | 2 | seeds | 1 |
| ream | 4 | resh | 6 | rines | 1 | rold | 1 | rps | 4 | saf | 6 | schmid | 2 | seek | 8 |
| reams | 3 | ress | 84 | ring | 30 | roll | 7 | rpse | 2 | safe | 6 | schmidt | 2 | seeks | 2 |
| reap | 1 | rest | 24 | rings | 3 | rom | 284 | rpst | 1 | sag | 2 | schn | 2 | seem | 31 |
| rear | 2 | ret | 26 | rink | 6 | rome | 2 | rr | 9 | sage | 2 | schne | 1 | seeme | 7 |
| reas | 35 | retc | 4 | rinks | 2 | romp | 2 | rre | 4 | sai | 86 | schnei | 1 | seemed | 7 |
| rease | 5 | retch | 4 | rint | 4 | rompt | 2 | rs | 721 | said | 69 | schni | 1 | seems | 14 |
| reast | 1 | rete | 2 | rinz | 1 | ron | 48 | r's | 3 | sail | 10 | schnit | 1 | seen | 12 |
| reat | 82 | rets | 2 | rip | 45 | rong | 18 | rse | 40 | sails | 1 | schnitz | 1 | seer | 1 |
| reats | 4 | rett | 1 | ripe | 2 | rongs | 4 | rse's | 1 | sain | 7 | scho | 25 | sees | 4 |
| reau | 8 | rette | 1 | rips | 2 | ront | 14 | rsh | 1 | saint | 7 | schoe | 1 | sei | 13 |
| reaus | 5 | rettes | 1 | ript | 2 | ronz | 1 | rst | 59 | sak | 1 | schoen | 1 | seil | 1 |
| rec | 69 | reu | 1 | ris | 79 | ronze | 1 | rt | 435 | sake | 1 | schol | 1 | seill | 1 |
| reck | 13 | rev | 5 | rise | 10 | roo | 42 | rth | 63 | sal | 42 | schoo | 23 | seille | 1 |
| recks | 4 | reve | 1 | rish | 5 | rooc | 1 | rth's | 2 | sale | 10 | school | 23 | seilles | 1 |
| rect | 32 | reves | 1 | risk | 2 | rooch | 1 | rts | 48 | sales | 2 | schools | 8 | seiz | 2 |
| red | 50 | rew | 19 | rism | 4 | roof | 5 | rt's | 3 | salt | 2 | scio | 4 | seize | 2 |
| rede | 2 | rewn | 1 | rit | 50 | rook | 7 | ru | 205 | sam | 47 | sciou | 4 | sel | 81 |
| redes | 2 | rews | 1 | rite | 11 | rooks | 2 | rub | 8 | same | 32 | scious | 4 | self | 39 |
| ree | 146 | rew's | 1 | rites | 6 | room | 15 | ruc | 28 | sams | 5 | sco | 9 | sell | 5 |
| reec | 4 | rey | 5 | ritt | 2 | rooms | 3 | ruck | 11 | san | 26 | scof | 1 | selm | 1 |
| reece | 4 | rf | 2 | ritz | 3 | roon | 2 | ruct | 7 | sanc | 2 | scoff | 1 | sels | 9 |
| reed | 7 | rg | 146 | riv | 51 | roons | 1 | rud | 1 | sand | 1 | scor | 6 | selv | 12 |
| reef | 1 | rge | 81 | rive | 2 | roos | 6 | rude | 1 | sane | 9 | score | 6 | selve | 12 |
| reefs | 1 | ri | 1002 | riz | 2 | roose | 6 | rue | 11 | sank | 4 | scores | 2 | selves | 12 |
| reek | 10 | ria | 17 | rk | 238 | root | 3 | ruf | 1 | sant | 1 | scot | 2 | sem | 9 |
| reeks | 1 | riag | 15 | rke | 2 | roots | 1 | rug | 3 | sar | 5 | scote | 1 | sen | 168 |
| reen | 8 | riage | 14 | rks | 21 | roots' | 1 | rui | 18 | sard | 2 | scotch | 1 | senc | 5 |
| reens | 1 | rib | 23 | rk's | 3 | rop | 42 | ruis | 12 | sas | 9 | scots | 1 | sence | 5 |
| reer | 8 | ribe | 6 | rl | 105 | rope | 3 | ruise | 2 | sat | 21 | scr | 28 | send | 5 |
| reers | 1 | ribes | 2 | rld | 21 | ropes | 2 | ruit | 6 | saul | 1 | scra | 5 | sens | 6 |
| rees | 5 | ric | 60 | rlds | 1 | roph | 2 | ruits | 3 | sault | 1 | scrap | 2 | sense | 6 |
| reet | 60 | rice | 13 | rld's | 2 | ror | 2 | rul | 14 | saults | 1 | scrat | 2 | sent | 44 |
| reets | 18 | rich | 15 | rle | 39 | ros | 29 | rule | 13 | sav | 10 | scrate | 2 | sents | 5 |
| reez | 5 | rick | 6 | rls | 21 | rose | 4 | rules | 2 | | | | | sep | 13 |
| reeze | 3 | rick's | 1 | | | ross | 12 | rum | 1 | | | | | seph | 5 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| seph's | 1 | show | 36 | skull | 4 | soak | 1 | split | 1 | starv | 1 | straigh | 3 | such | 46 |
| ser | 64 | shown | 1 | sky | 1 | sof | 5 | spo | 37 | stat | 90 | straight | 3 | sud | 11 |
| sert | 9 | shows | 1 | sl | 32 | soft | 3 | spoi | 1 | state | 86 | strain | 13 | sue | 2 |
| serts | 4 | shr | 2 | sla | 8 | sol | 21 | spoil | 1 | states | 30 | straint | 2 | suf | 42 |
| serv | 32 | shro | 2 | slac | 1 | sold | 12 | spok | 1 | stay | 11 | stran | 11 | sug | 5 |
| serve | 6 | shroe | 2 | slack | 1 | sole | 3 | spoke | 1 | ste | 72 | strand | 1 | sui | 9 |
| serves | 2 | shu | 11 | slam | 1 | solv | 2 | spon | 19 | stea | 29 | strang | 5 | suit | 9 |
| ses | 27 | shut | 1 | sle | 10 | solve | 2 | spond | 3 | stead | 7 | strange | 4 | suits | 1 |
| se's | 1 | shy | 1 | sled | 1 | som | 122 | spons | 2 | steal | 1 | strap | 1 | sul | 35 |
| sess | 5 | si | 556 | sledg | 1 | some | 118 | sponse | 2 | steal's | 1 | straps | 1 | sult | 28 |
| set | 31 | sia | 9 | sledge | 1 | son | 159 | spor | 5 | steam | 16 | stras | 1 | sults | 5 |
| sets | 2 | sian | 8 | slee | 7 | song | 2 | sport | 5 | stear | 2 | strass | 1 | sum | 40 |
| sett | 4 | sib | 1 | sleep | 6 | sons | 26 | sports | 2 | stearn | 1 | strat | 2 | sume | 1 |
| setts | 4 | sic | 3 | sleev | 1 | soo | 21 | soot | 6 | stearns | 1 | strate | 2 | sump | 2 |
| sev | 26 | sick | 1 | sleeve | 1 | soon | 21 | spots | 1 | stee | 3 | strates | 1 | sums | 2 |
| sex | 5 | sid | 93 | slen | 1 | sor | 17 | spou | 1 | steel | 2 | stre | 70 | sun | 7 |
| sey | 10 | side | 58 | slep | 1 | sorn | 1 | spous | 1 | steer | 1 | strea | 3 | sunk | 2 |
| sh | 573 | sides | 12 | slept | 1 | sort | 9 | spouse | 1 | stei | 2 | stream | 3 | sup | 35 |
| sha | 39 | sie | 17 | sli | 11 | sorts | 2 | spr | 12 | stein | 2 | streams | 2 | sur | 48 |
| shae | 1 | sieg | 2 | slid | 1 | sou | 13 | spra | 1 | stel | 1 | stree | 59 | surd | 1 |
| shaf | 2 | siege | 2 | slide | 1 | soug | 2 | spran | 1 | sten | 2 | street | 59 | sure | 14 |
| shaft | 2 | sier | 8 | slig | 5 | sough | 2 | sprang | 1 | stenc | 1 | streets | 17 | surg | 1 |
| shafts | 1 | sies | 3 | sligh | 5 | sought | 2 | spre | 1 | stench | 1 | stren | 4 | sus | 20 |
| shak | 4 | sig | 15 | slight | 5 | soun | 1 | sprea | 1 | step | 7 | streng | 3 | sut | 1 |
| shake | 4 | sigh | 8 | slim | 1 | sound | 1 | spread | 1 | steps | 1 | strengt | 3 | sw | 54 |
| shakes | 4 | sight | 8 | sling | 1 | sour | 6 | spri | 8 | ster | 10 | strength | 3 | swa | 5 |
| shal | 18 | sign | 29 | slip | 3 | sourc | 6 | sprin | 8 | stern | 1 | stret | 3 | swan | 5 |
| shall | 17 | signs | 2 | sliv | 1 | sout | 31 | spring | 8 | sters | 2 | strete | 3 | swe | 25 |
| sham | 3 | sigs | 1 | slo | 3 | south | 31 | springs | 2 | steu | 8 | stretch | 3 | swea | 2 |
| shame | 3 | sil | 5 | slow | 2 | sov | 1 | spro | 1 | steul | 8 | strew | 1 | swear | 1 |
| shap | 3 | silk | 2 | sm | 41 | sow | 1 | sprou | 1 | steuls | 2 | strewn | 1 | swears | 1 |
| shape | 1 | silt | 1 | sma | 11 | sp | 201 | sprout | 1 | steuls' | 2 | stri | 20 | sweat | 1 |
| shar | 5 | sim | 21 | smal | 10 | spa | 14 | spru | 1 | sti | 43 | stric | 5 | swee | 10 |
| share | 3 | sin | 55 | small | 10 | spac | 1 | sprun | 1 | stic | 1 | strick | 2 | sweep | 4 |
| sharp | 1 | sinc | 35 | smas | 1 | space | 1 | sprung | 1 | stick | 1 | strict | 3 | sweeps | 1 |
| shaw | 2 | since | 35 | smash | 1 | spai | 3 | sq | 6 | stif | 1 | strif | 1 | sweet | 3 |
| she | 153 | sing | 7 | sme | 2 | spain | 3 | squ | 6 | stiff | 1 | strife | 1 | swep | 2 |
| shed | 8 | sio | 54 | smel | 2 | span | 8 | squa | 5 | stil | 23 | strik | 4 | swept | 2 |
| sheds | 1 | sion | 82 | smell | 2 | spans | 1 | squad | 4 | stile | 8 | strike | 4 | swer | 10 |
| shek | 1 | sions | 11 | smells | 1 | spar | 2 | squads | 1 | stiles | 8 | strikes | 1 | swers | 1 |
| shel | 2 | siou | 2 | smi | 8 | spark | 1 | squar | 1 | still | 14 | strin | 2 | swi | 21 |
| shep | 2 | sioux | 2 | smid | 1 | sparks | 1 | square | 1 | stir | 2 | string | 2 | swif | 2 |
| sher | 6 | sip | 7 | smil | 3 | spe | 90 | sque | 1 | stit | 2 | striv | 1 | swift | 2 |
| shi | 54 | sir | 8 | smile | 1 | spea | 10 | squel | 1 | stite | 1 | stro | 21 | swim | 9 |
| shin | 1 | sire | 2 | smiles | 1 | speak | 9 | squelc | 1 | stitch | 1 | strok | 1 | swin | 6 |
| shine | 1 | sires | 1 | smilt | 4 | spear | 1 | squelch | 1 | sto | 106 | stroke | 4 | swing | 4 |
| ship | 48 | sis | 52 | smith | 4 | spears | 1 | ss | 352 | stoc | 3 | stron | 11 | swit | 4 |
| shipp | 1 | sist | 29 | smith's | 1 | spec | 13 | sse | 3 | stock | 3 | strong | 11 | swite | 3 |
| ships | 8 | sists | 1 | smo | 4 | spect | 6 | st | 1396 | stod | 1 | strongs | 2 | switch | 3 |
| shir | 3 | sit | 14 | smok | 2 | sped | 2 | sta | 244 | stol | 9 | stroy | 9 | switz | 1 |
| shire | 3 | site | 5 | smoke | 2 | spee | 10 | stab | 1 | stole | 3 | stru | 30 | swo | 2 |
| shiv | 2 | sits | 2 | smoo | 2 | speec | 6 | staf | 4 | stom | 2 | struc | 28 | swor | 2 |
| shive | 1 | siv | 15 | smoot | 2 | speech | 6 | staff | 4 | ston | 15 | struck | 11 | sword | 2 |
| sho | 122 | sive | 15 | smooth | 1 | speed | 1 | stag | 3 | stone | 13 | struct | 7 | swu | 1 |
| shoc | 3 | six | 1 | sms | 1 | spel | 2 | stage | 2 | stones | 4 | strug | 1 | swun | 1 |
| shock | 3 | sixt | 1 | smu | 1 | spell | 2 | stak | 2 | ston's | 1 | sts | 44 | swung | 1 |
| shocks | 1 | sixth | 1 | smug | 1 | spen | 16 | stake | 2 | stoo | 11 | stu | 16 | sy | 55 |
| shoo | 3 | siz | 5 | smy | 1 | spend | 7 | stakes | 1 | stood | 11 | stub | 1 | syl | 7 |
| shook | 1 | size | 4 | smyr | 1 | spends | 3 | stal | 12 | stop | 18 | stud | 4 | sym | 7 |
| shoot | 2 | sk | 69 | sn | 7 | spent | 7 | stall | 4 | stops | 2 | stuf | 2 | symp | 1 |
| shop | 2 | ske | 2 | sna | 1 | spi | 13 | stam | 2 | stor | 23 | stuff | 2 | syn | 1 |
| shops | 1 | sket | 2 | snap | 1 | spic | 1 | stan | 54 | store | 7 | stun | 1 | syr | 2 |
| shor | 38 | skete | 2 | snaps | 1 | spin | 2 | stanc | 11 | stores | 1 | stur | 1 | sys | 29 |
| shore | 8 | sketch | 2 | sne | 2 | spine | 1 | stance | 8 | stork | 1 | sty | 3 | | |
| short | 30 | ski | 9 | snea | 2 | spir | 16 | stanch | 1 | storm | 1 | styl | 2 | ta | 722 |
| shorts | 1 | skil | 2 | sneak | 2 | spit | 9 | stand | 29 | storms | 3 | style | 2 | tab | 12 |
| shot | 8 | skin | 3 | sno | 3 | spite | 9 | stands | 2 | stov | 1 | su | 383 | tac | 12 |
| shou | 31 | skir | 1 | snow | 3 | spl | 5 | stant | 8 | stove | 1 | sua | 5 | tack | 10 |
| shoul | 30 | skirt | 1 | snu | 1 | sple | 3 | star | 29 | str | 176 | suad | 4 | tacks | 2 |
| should | 28 | sks | 2 | snug | 1 | splen | 3 | stars | 1 | stra | 35 | suade | 4 | tact | 1 |
| shout | 1 | sku | 4 | so | 537 | spli | 2 | start | 21 | strai | 16 | sub | 21 | taf | 10 |
| shov | 1 | skul | 11 | soa | 1 | splin | 1 | starts | 3 | straig | 3 | suc | 67 | taff | 4 |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| taft | 6 | teenth | 2 | thick | 2 | tic | 82 | tone | 13 | trays | 1 | troub | 5 | twift | 1 |
| taft's | 1 | teer | 4 | thie | 2 | tice | 12 | tones | 4 | tre | 123 | troup | 3 | twin | 5 |
| tag | 13 | tees | 8 | thief | 1 | tick | 11 | tong | 1 | trea | 32 | troups | 3 | twins | 1 |
| tage | 5 | teet | 6 | thiev | 1 | ticks | 18 | tongu | 1 | tream | 3 | trout | 2 | ty | 239 |
| tag's | 1 | teeth | 6 | thieve | 1 | tie | 46 | tons | 4 | treams | 2 | tru | 63 | tyl | 2 |
| tai | 109 | tei | 2 | thieves | 1 | tied | 1 | ton's | 1 | treas | 18 | truc | 28 | tyle | 2 |
| tail | 14 | tein | 2 | thin | 85 | ties | 42 | too | 43 | treat | 9 | truck | 11 | typ | 9 |
| tails | 5 | tel | 28 | thing | 65 | tif | 4 | tood | 1 | tred | 3 | truct | 7 | type | 8 |
| tain | 95 | tell | 15 | things | 14 | tiff | 3 | took | 15 | trede | 2 | trud | 1 | types | 2 |
| tains | 9 | tells | 5 | think | 17 | tift | 2 | top | 42 | tredes | 2 | trude | 1 | tyr | 4 |
| tak | 14 | tem | 70 | thinks | 5 | tig | 4 | tops | 11 | tree | 64 | true | 11 | tys | 1 |
| take | 14 | temp | 25 | thir | 3 | tigh | 4 | tor | 113 | trees | 2 | trug | 1 | tz | 19 |
| takes | 9 | tempt | 23 | third | 2 | tight | 4 | tore | 7 | treet | 59 | trun | 4 |  |  |
| tal | 85 | tempts | 1 | thirs | 1 | til | 87 | tores | 1 | treets | 17 | trunk | 4 | ua | 63 |
| tale | 2 | tems | 3 | thirst | 1 | tile | 8 | tork | 1 | trem | 9 | trunks | 1 | uad | 9 |
| talk | 19 | ten | 153 | this | 217 | tiles | 8 | torm | 4 | treme | 8 | trus | 11 | uade | 4 |
| talks | 6 | tenc | 6 | thiz | 2 | till | 18 | torms | 3 | tren | 5 | trust | 8 | uads | 3 |
| tall | 5 | tence | 1 | thize | 2 | tils | 1 | torn | 1 | trend | 1 | trusts | 1 | uag | 3 |
| tals | 1 | tench | 1 | tho | 103 | tim | 122 | tors | 24 | treng | 3 | trut | 5 | uage | 2 |
| tam | 5 | tend | 58 | thol | 1 | time | 106 | tos | 1 | trengt | 3 | truth | 5 | uai | 3 |
| tan | 82 | tends | 7 | thom | 10 | times | 19 | tot | 2 | trength | 3 | trux | 1 | uain | 3 |
| tanc | 23 | tens | 1 | thomp | 1 | tims | 2 | tou | 24 | trep | 1 | try | 56 | uaint | 3 |
| tance | 19 | tense | 1 | thon | 1 | tin | 100 | touc | 3 | tres | 2 | ts | 454 | uak | 1 |
| tanch | 1 | tent | 16 | thor | 21 | tinc | 1 | touch | 3 | tress | 2 | t's | 10 | uake | 1 |
| tand | 39 | tents | 4 | thos | 25 | tinct | 1 | tour | 20 | tret | 3 | ts' | 3 | ual | 9 |
| tands | 2 | tep | 7 | those | 25 | tine | 4 | tours | 1 | trete | 3 | tt | 46 | uan | 2 |
| tank | 1 | teps | 1 | thou | 41 | ting | 61 | tout | 1 | tretch | 3 | tte | 10 | uar | 30 |
| tant | 12 | ter | 463 | thoug | 41 | tings | 2 | tov | 1 | trev | 1 | ttes | 1 | uard | 11 |
| tants | 2 | tere | 1 | though | 41 | tio | 712 | tove | 1 | trew | 1 | tts | 11 | uare | 1 |
| tap | 2 | term | 13 | thought | 9 | tion | 712 | tow | 30 | trewn | 1 | tt's | 5 | uart | 1 |
| taps | 1 | terms | 10 | thoughts | 1 | tions | 96 | town | 18 | tri | 139 | tu | 258 | uarts | 1 |
| tar | 41 | tern | 1 | thr | 81 | tiq | 5 | toy | 6 | tria | 1 | tub | 3 | uat | 1 |
| tars | 1 | terr | 3 | thre | 10 | tiqu | 3 | toyc | 1 | trib | 3 | tube | 2 | uate | 1 |
| tart | 21 | terre | 3 | threa | 8 | tique | 3 | tr | 762 | tribe | 2 | tuc | 3 | ub | 154 |
| tarts | 3 | ters | 61 | threat | 8 | tir | 37 | tra | 206 | tric | 31 | tuck | 3 | ube | 3 |
| tarv | 1 | te's | 2 | threats | 1 | tire | 24 | trac | 46 | trice | 2 | tud | 12 | ubt | 17 |
| tas | 11 | test | 17 | thres | 1 | tires | 3 | trace | 2 | trick | 4 | tude | 8 | ubts | 1 |
| task | 4 | tests | 2 | thresh | 1 | tis | 12 | track | 10 | trict | 12 | tudes | 1 | uc | 195 |
| tast | 3 | teu | 11 | threw | 1 | tise | 2 | tracks | 2 | tricts | 1 | tue | 14 | uce | 2 |
| taste | 3 | teul | 6 | thri | 2 | tist | 3 | tract | 25 | trid | 1 | tues | 11 | uch | 94 |
| tat | 100 | teuls | 2 | thrif | 1 | tiste | 1 | tracts | 4 | tridg | 1 | tuf | 2 | uck | 23 |
| tate | 96 | teuls' | 2 | thrift | 1 | tists | 2 | trad | 2 | trie | 7 | tuff | 2 | uck's | 1 |
| tates | 31 | teur | 1 | thril | 1 | tit | 3 | trade | 2 | tried | 3 | tug | 1 | uct | 20 |
| tau | 3 | tex | 8 | thrill | 1 | tite | 1 | traf | 4 | tries | 4 | tui | 1 | ucts | 3 |
| taug | 1 | text | 2 | thro | 69 | titch | 1 | trag | 9 | trif | 1 | tum | 6 | ud | 83 |
| taugh | 1 | th | 6938 | throa | 2 | tite | 1 | trai | 45 | trife | 1 | tume | 1 | ude | 16 |
| taught | 1 | tha | 669 | throat | 2 | tiv | 64 | traig | 3 | trik | 4 | tumes | 1 | udes | 3 |
| tav | 3 | tham | 2 | thron | 3 | tive | 61 | traigh | 3 | trike | 4 | tumn | 1 | udg | 21 |
| tax | 19 | thame | 2 | throng | 1 | tives | 11 | traight | 3 | trikes | 1 | tun | 19 | udge | 12 |
| tay | 19 | thames | 2 | throngs | 1 | tiz | 3 | trail | 5 | tril | 1 | tune | 11 | udges | 9 |
| te | 38 | than | 72 | throu | 50 | tl | 80 | train | 37 | trils | 1 | tunes | 1 | ue | 161 |
| tch | 38 | that | 594 | throug | 50 | tle | 80 | trains | 3 | trim | 9 | tup | 2 | uee | 4 |
| te | 1608 | the | 4935 | through | 50 | tled | 9 | traint | 2 | trin | 6 | tur | 138 | ueen | 4 |
| tea | 39 | thef | 2 | throw | 14 | tles | 2 | tral | 8 | trinc | 4 | turb | 3 | ueen's | 1 |
| teac | 5 | theft | 2 | thrown | 8 | to | 2036 | tran | 29 | trines | 1 | ture | 63 | uei | 1 |
| teach | 5 | thei | 112 | throws | 1 | toa | 4 | tranc | 11 | tring | 2 | tures | 16 | ueil | 1 |
| tead | 7 | their | 112 | ths | 20 | toc | 3 | trance | 8 | trip | 33 | turn | 53 | uel | 2 |
| teal | 4 | them | 69 | th's | 18 | tock | 3 | trand | 1 | trips | 1 | turns | 5 | uelc | 1 |
| teals | 1 | theme | 1 | ths' | 1 | tod | 2 | trang | 6 | triv | 1 | tus | 6 | uelch | 1 |
| team | 19 | themes | 1 | thu | 21 | tol | 2 | trange | 5 | tro | 85 | tut | 6 | uell | 1 |
| tear | 2 | then | 44 | thud | 1 | toe | 2 | trans | 6 | troi | 7 | tute | 6 | uen | 11 |
| tearn | 1 | ther | 182 | thum | 1 | toes | 2 | trap | 9 | troit | 7 | tutes | 1 | uenc | 4 |
| tearns | 1 | there | 135 | thumb | 1 | toi | 6 | trapp | 7 | trok | 1 | tw | 35 | uence | 4 |
| teau | 1 | thers | 4 | thun | 5 | toil | 1 | traps | 1 | troke | 1 | twe | 29 | uent | 5 |
| tec | 13 | thes | 52 | thur | 10 | toir | 3 | tras | 3 | trol | 19 | twee | 27 | uer | 5 |
| tech | 1 | these | 50 | thurs | 9 | toire | 3 | trass | 1 | troll | 4 | tween | 27 | ues | 62 |
| tect | 5 | thet | 1 | thus | 2 | tol | 28 | trast | 2 | tron | 16 | twel | 2 | uess | 4 |
| ted | 158 | they | 161 | thy | 5 | told | 13 | trat | 9 | trong | 11 | twelf | 2 | uest | 18 |
| tee | 66 | thi | 315 | ti | 1461 | tole | 3 | trate | 9 | trongs | 2 | twelft | 2 | uests | 13 |
| teel | 4 | thic | 2 | tia | 10 | toll | 4 | trates | 3 | trop | 1 | twelfth | 2 | uet | 2 |
| teen | 3 |  |  | tial | 6 | tolls | 1 | trav | 12 | trot | 3 | twi | 6 | uf | 91 |
| teent | 2 |  |  | tian | 3 | tom | 17 | tray | 2 | trou | 10 | twif | 1 | uff | 5 |
|  |  |  |  |  |  | toms | 4 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | ton | 103 |  |  |  |  |  |  |  |  |

| Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence | Letter Groups | Total Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| uff's | 1 | uors | 1 | var | 2 | vom | 1 | wealt | 6 | whol | 24 | wors | 4 | yers | 3 |
| ug | 197 | uot | 6 | vard | 1 | von | 3 | wealth | 6 | whole | 24 | worse | 2 | yes | 59 |
| ugh | 171 | uote | 4 | vas | 2 | vor | 24 | wealths | 1 | whom | 23 | worst | 2 | yet | 21 |
| ughe | 6 | uotes | 1 | vast | 2 | vore | 3 | weap | 1 | whos | 14 | wort | 13 | yi | 2 |
| ughes | 6 | up | 195 | vat | 8 | vos | 1 | wear | 8 | whose | 14 | worth | 13 | yie | 2 |
| ught | 55 | upp | 1 | vate | 7 | voss | 1 | wears | 1 | why | 18 | wou | 119 | yiel | 2 |
| ughts | 2 | ups | 3 | vau | 2 | vot | 33 | weat | 9 | wi | 830 | woul | 111 | yield | 2 |
| ui | 140 | upt | 9 | vaul | 2 | vote | 28 | weath | 8 | wic | 4 | would | 111 | yl | 23 |
| uic | 6 | ur | 787 | vault | 2 | votes | 12 | wed | 3 | wich | 1 | woun | 8 | yle | 5 |
| uick | 6 | urb | 5 | ve | 902 | vou | 3 | wee | 86 | wick | 3 | wound | 8 | yles | 2 |
| uid | 2 | urbs | 2 | vea | 2 | vous | 3 | week | 49 | wid | 5 | wounds | 1 | ym | 12 |
| uide | 2 | urc | 35 | veal | 2 | vow | 2 | weeks | 18 | wide | 5 | wr | 56 | ymp | 1 |
| uides | 2 | urch | 29 | veg | 1 | vows | 1 | ween | 27 | wie | 1 | wra | 2 | yn | 25 |
| uil | 53 | urd | 3 | vel | 3 | voy | 3 | weep | 4 | wiel | 1 | wrap | 2 | ync | 2 |
| uild | 43 | urde | 2 | vem | 1 | vr | 1 | weeps | 1 | wield | 1 | wre | 12 | ynch | 2 |
| uilt | 9 | urdes | 2 | ven | 69 | vre | 1 | weet | 3 | wif | 36 | wrec | 12 | yne | 13 |
| uin | 2 | ure | 118 | veng | 1 | vy | 6 | weg | 1 | wife | 33 | wreck | 12 | ynes | 1 |
| uinn | 2 | ures | 22 | vent | 27 | wa | 777 | wei | 14 | wife's | 5 | wrecks | 1 | yo | 130 |
| uip | 2 | urg | 38 | vents | 12 | wad | 1 | weig | 10 | wift | 3 | wri | 32 | yon | 5 |
| uir | 9 | urge | 2 | ver | 186 | wade | 1 | weigh | 9 | wil | 355 | wrig | 10 | yond | 5 |
| uire | 5 | urk | 4 | vere | 7 | wag | 1 | weighs | 1 | wild | 2 | wrigh | 10 | yor | 59 |
| uis | 21 | urke | 2 | verg | 1 | wai | 20 | weil | 3 | will | 352 | wright | 10 | york | 59 |
| uise | 3 | url | 1 | verge | 1 | wais | 1 | weill | 3 | wim | 9 | writ | 15 | you | 65 |
| uish | 7 | urn | 74 | vers | 13 | waist | 1 | wel | 49 | win | 36 | write | 6 | youn | 31 |
| uit | 27 | urne | 1 | verse | 7 | wait | 18 | welf | 2 | wind | 11 | writes | 4 | young | 31 |
| uite | 9 | urns | 6 | vert | 1 | waits | 4 | welft | 2 | winds | 2 | wro | 10 | your | 8 |
| uith | 1 | urns' | 1 | ves | 89 | waiv | 1 | welfth | 2 | wine | 4 | wron | 6 | yp | 12 |
| uits | 7 | urs | 53 | vest | 8 | wak | 1 | well | 35 | wing | 6 | wrong | 6 | ype | 8 |
| uk | 2 | urse | 17 | vet | 11 | wal | 21 | wels | 5 | wink | 1 | wrongs | 1 | ypes | 2 |
| ul | 347 | urst | 1 | vett | 6 | wale | 3 | welsh | 5 | wins | 1 | wrot | 3 | yr | 7 |
| uld | 146 | urt | 70 | vex | 1 | wales | 3 | welt | 2 | wip | 2 | wrote | 3 | ys | 197 |
| ule | 16 | urth | 3 | vey | 3 | walk | 8 | wen | 27 | wir | 12 | ws | 79 | y's | 13 |
| ules | 2 | urts | 11 | vi | 221 | walks | 2 | went | 26 | wire | 11 | w's | 4 | ys' | 2 |
| ulf | 1 | urt's | 1 | via | 7 | wall | 8 | wep | 2 | wires | 2 | wt | 2 | yt | 3 |
| ulg | 2 | urv | 2 | vic | 43 | walls | 4 | wept | 2 | wis | 12 | wth | 2 | yx | 1 |
| ulge | 2 | urve | 1 | vice | 17 | walt | 1 | wer | 199 | wise | 2 | wu | 3 | yz | 1 |
| ulk | 3 | us | 578 | vict | 8 | waltz | 1 | were | 188 | wish | 9 | wun | 1 | za | 21 |
| ull | 17 | use | 80 | victs | 3 | wan | 33 | werp | 1 | wit | 356 | wung | 1 | zan | 2 |
| ulp | 1 | ush | 17 | vid | 15 | want | 23 | wers | 1 | witc | 3 | wur | 2 | zar | 3 |
| ulp's | 1 | uss | 7 | vide | 2 | wants | 4 | wes | 46 | witch | 3 | wurt | 2 | ze | 38 |
| uls | 2 | ust | 91 | vie | 19 | war | 74 | west | 35 | with | 337 | wurth | 2 | zea | 1 |
| ul's | 1 | usts | 2 | vier | 1 | ward | 35 | wh | 847 | witz | 1 | wy | 7 | zeal | 1 |
| uls' | 1 | ut | 502 | view | 18 | wards | 3 | wha | 62 | wiv | 1 | xe | 2 | zel | 5 |
| ult | 35 | ute | 44 | views | 2 | ward's | 1 | what | 62 | wive | 1 | xt | 30 | zell | 1 |
| ults | 6 | utes | 10 | vig | 2 | ware | 3 | whe | 205 | wives | 1 | xth | 1 | zen | 11 |
| um | 138 | uth | 12 | vil | 15 | warm | 3 | whea | 2 | wk | 11 | ya | 17 | zens | 6 |
| umb | 3 | uts | 5 | vill | 1 | warn | 4 | wheat | 2 | wl | 8 | yac | 2 | zer | 1 |
| ume | 7 | utt | 1 | ville | 1 | wart | 1 | whee | 5 | wn | 142 | yach | 2 | zers | 1 |
| umes | 2 | utz | 1 | vils | 1 | was | 513 | wheel | 5 | wns | 3 | yacht | 2 | zes | 1 |
| umn | 5 | ux | 11 | vin | 9 | wash | 26 | wheels | 2 | wo | 348 | yar | 15 | zi | 11 |
| umn's | 2 | uxe | 1 | ving | 2 | wast | 2 | when | 136 | wom | 43 | yard | 15 | zie | 5 |
| ump | 19 | uy | 12 | vio | 3 | waste | 1 | whenc | 1 | won | 13 | yards | 6 | zier | 2 |
| umps | 3 | uz | 3 | vior | 2 | wat | 16 | whence | 1 | woo | 12 | yd | 2 | zil | 1 |
| ums | 4 | va | 143 | viou | 1 | watc | 10 | wher | 53 | wood | 8 | ye | 249 | zim | 1 |
| un | 595 | vad | 1 | vious | 1 | watch | 10 | where | 53 | woods | 1 | yea | 147 | zin | 4 |
| unc | 28 | vade | 1 | vir | 7 | wau | 1 | whet | 9 | wool | 4 | year | 147 | zinc | 1 |
| unch | 7 | vades | 1 | vis | 56 | wav | 1 | wheth | 9 | wor | 161 | years | 84 | zine | 2 |
| und | 133 | vai | 10 | vise | 2 | wave | 1 | whi | 293 | word | 14 | year's | 2 | zing | 1 |
| unds | 23 | vail | 9 | vit | 6 | way | 68 | whic | 226 | words | 3 | yee | 3 | zl | 2 |
| une | 39 | vain | 1 | vite | 2 | wayn | 6 | which | 226 | wore | 2 | yel | 2 | zle | 2 |
| unes | 10 | val | 34 | vites | 1 | wayne | 6 | whil | 36 | worl | 20 | yell | 1 | zled | 1 |
| ung | 37 | vals | 1 | vits | 1 | ways | 2 | while | 36 | world | 20 | yer | 7 | zo | 13 |
| unge | 1 | valv | 2 | vo | 133 | wd | 13 | whir | 3 | worlds | 1 | | | zon | 8 |
| unk | 7 | valve | 2 | voi | 25 | wds | 2 | whirl | 3 | world's | 1 | | | zone | 1 |
| unks | 1 | van | 27 | voic | 22 | we | 496 | whis | 5 | worm | 1 | | | zu | 3 |
| uns | 3 | vane | 8 | voice | 15 | wea | 27 | whit | 23 | worms | 1 | | | zur | 1 |
| unt | 49 | vance | 5 | void | 6 | weak | 3 | white | 21 | worn | 2 | | | zy | 2 |
| unts | 6 | vant | 2 | vol | 15 | weal | 6 | white's | 2 | | | | | zym | 1 |
| uo | 15 | | | volt | 3 | | | who | 229 | | | | | | |
| uor | 9 | | | volv | 5 | | | | | | | | | | |

# Appendix E

Table Showing, by Actual Recurrence and by Percentage of Total Letter Recurrence, the Rank of the Several Letters of the Alphabet and of the Digits and Marks of Punctuation Found in the Text Used as the Basis of the Count Presented in Appendix C (*ante*), together with the Recurrence of the Capital Letters Therein.

*Note.*—The text chosen for this count was found to contain 48,203 words, 221,787 letters, 15,084 capital letters, 1,613 digits or numerals, and 7,661 punctuation marks.

## 1. ALPHABET

| Letters | Total Recurrence | Percentage of Total | Capitals Recurrence | Letters | Total Recurrence | Percentage of Total | Capitals Recurrence | Letters | Total Recurrence | Percentage of Total | Capitals Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | 18,260 | 8.23 | 1,093 | j | 519 | .24 | 378 | s | 13,939 | 6.28 | 1,256 |
| b | 3,427 | 1.55 | 656 | k | 1,221 | .55 | 190 | t | 21,205 | 9.56 | 1,227 |
| c | 6,807 | 3.07 | 1,005 | l | 8,973 | 4.05 | 542 | u | 5,366 | 2.42 | 283 |
| d | 8,407 | 3.79 | 564 | m | 5,404 | 2.44 | 777 | v | 1,924 | .87 | 111 |
| e | 28,664 | 12.92 | 1.026 | n | 16,044 | 7.23 | 755 | w | 4,180 | 1.88 | 547 |
| f | 5,614 | 2.53 | 538 | o | 16,955 | 7.64 | 671 | x | 335 | .15 | 10 |
| g | 3,863 | 1.74 | 406 | p | 4,082 | 1.84 | 575 | y | 3,811 | 1.72 | 225 |
| h | 12,632 | 5.70 | 745 | q | 153 | .07 | 22 | z | 101 | .05 | 16 |
| i | 15,593 | 7.03 | 719 | r | 14,308 | 6.45 | 767 | | | | |

## 2. PUNCTUATION MARKS

| Marks | Recurrence | Percentage |
|---|---|---|
| period | 3,196 | 40.625 |
| comma | 2,370 | 30.126 |
| colon | 57 | .725 |
| semi-colon | 56 | .712 |
| interrogation | 25 | .318 |
| exclamation | 18 | .229 |
| dash | 214 | 2.720 |
| parentheses | 41 (82) | 1.042 |
| quotations | 165 (330) | 4.195 |
| apostrophe | 230 | 2.924 |
| hyphen | 1,279 | 16.258 |
| asterisk | 10 | .127 |

## 3. NUMERALS

| Digits | Recurrence | Percentage |
|---|---|---|
| 0 | 469 | 29.076 |
| 1 | 324 | 20.087 |
| 2 | 134 | 8.308 |
| 3 | 143 | 8.865 |
| 4 | 77 | 4.774 |
| 5 | 114 | 7.068 |
| 6 | 73 | 4.526 |
| 7 | 110 | 6.820 |
| 8 | 74 | 4.588 |
| 9 | 95 | 5.890 |

# APPENDIX F

## SYNOPSIS OF STANDARD DOT SYSTEM

### Reader's Key

*Note.*—The characters employed are here arranged in parallel lines of ten symbols each, the grouping being based, for the most part, upon the forms of the first ten letters of the alphabet in proper succession.

Line I is formed of dots 1-2-4-5. When immediately preceded by the numeral prefix, dots 3-6, they are used for figures or numerals.

| | a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE I** | 1 | 1-2 | 1-4 | 1-1-5 | 1-5 | 1-2-4 | 1-2-4-5 | 1-2-5 | 2-4 | 2-4-5 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| | a | but | could | would | the | for | great | had | I | has |

Line II is formed by adding dot 3 to each of the characters of Line I.

| | k | l | m | n | o | p | q | r | s | t |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE II** | 1-3 | 1-2-3 | 1-3-4 | 1-3-4-5 | 1-3-5 | 1-2-3-4 | 1-2-3-4-5 | 1-2-3-5 | 2-3-4 | 2-3-4-5 |
| | of | little | made | not | O | people % | this | their | some | to |

Line III is formed by adding dots 3-6 to each character of Line I. The omission of *w* from the regular sequence of the alphabet in this line is owing to its not being in the French alphabet.

| | u | v | x | y | z | | cr | is | en | ch |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE III** | 1-3-6 | 1-2-3-6 | 1-3-4-6 | 1-3-4-5-6 | 1-3-5-6 | 1-2-3-4-6 | 1-2-3-4-5-6 | 1-2-3-5-6 | 2-3-4-6 | 2-3-4-5-6 |
| | under | have | it | by | as | and fraction warning | or vin- culum | is >greater than | an | which <less than |

Line IV is formed by adding dot 6 to each character of Line I.

| | | er | tion | in | en | ar | ou | th | es | w |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE IV** | 1-6 | 1-2-6 | 1-4-6 | 1-1-5-6 | 1-5-6 | 1-2-4-6 | 1-2-4-5-6 | 1-2-5-6 | 2-4-6 | 2-4-5-6 |
| | diaresis | were | | in ÷ divided by | been × multiplied by | are | out = equals | that radical sign | yesterday + plus | will |

Line V—Punctuations. These are low-level characters in the same order as those of Line I and are formed of dots 2-3-5-6.

| | - | . | : | ' | ? | ! | ( ) | " " | ; | [ ] |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE V** | 2 | 2-3 | 2-5 | 2-5-6 | 2-6 | 2-3-5 | 2-3-5-6 | 2-3-6 | 3-5 | 3-5-6 |
| | hyphen, minus | period, italic prefix, decimal point | . ratio, colon, small capital prefix | apos-trophe | question mark, grave accent | circum-flex accent, tilde | paren-thesis | quota-tion | semi-colon, acute accent | brackets |

| | , | / | ed | on | ing | # | & | $ | ¢ | £ |
|---|---|---|---|---|---|---|---|---|---|---|
| **LINE VI** | 3 | 3-4 | 3-4-5 | 3-4-5-6 | 3-4-6 | 3-6 | 1-2-3-4-6-8 | 1-4-5-6-9 | 1-4-8-9 | 3-6-7-8-9 |
| | comma, capital prefix | fraction line | | exponent sign | | numeral | ampers-and | dollar sign | cent sign | pounds sterling |

**LINE VII**

| 1-4-7 | 1-1-5-7 | 1-5-7 | 1-2-1-7 | 1-2-4-5-7 | 1-2-5-7 | 2-4-7 | 2-1-5-7 |
|---|---|---|---|---|---|---|---|
| other | year | before | after | about | his | be | with |
| | algebraic 4 | algebraic 5 | algebraic 2 | algebraic 7 | algebraic 8 | algebraic 9 | algebraic zero |

Line VIII—All except the first two characters of this line are formed by adding dot 8 to the corresponding characters of Line I.

**LINE VIII**

| 2-5-2-5 | 2-5-7 | 1-4-8 | 1-4-5-8 | 1-5-8 | 1-2-4-8 | 1-2-4-5-8 | 1-2-5-8 | 2-4-8 | 2-4-5-8 |
|---|---|---|---|---|---|---|---|---|---|
| proportion sign | work | there | do | all | from | more | said | last | when |
| | | algebraic 3 | degrees | algebraic 1 | algebraic 6 | | | algebraic 9 | |

Line IX. In this line, dots 7 and 8 are added to characters of Line I.

**LINE IX**

| 2-5-7-8 | 1-4-7-8 | 1-4-5-7-8 | 1-5-7-8 | 1-2-4-7-8 | 1-2-4-5-7-8 | 1-2-5-7-8 | 2-4-7-8 | 2-4-5-7-8 |
|---|---|---|---|---|---|---|---|---|
| first | until | what | who | day | mathematical infinity | was | over | time |

**LINE X**

| | | ç | — | | ( | ) | } | ^ | ] |
|---|---|---|---|---|---|---|---|---|---|
| 2-3-5-6-8-9 | 2-3-6-8-9 | 2-5-9 | 3-6-9 | 2-6-8 | 1-2-3-6-9 | 2-3-5-6-9 | 2-3-6-9 | 3-5-9 | 3-5-6-9 |
| infinity | differential | cedilla | dash | asterisk | angle sign | parenthesis ended | brace ending | caret | bracket ended |

**LINE XI**

| . | ⌐ | ′ | | | | | | ″ | |
|---|---|---|---|---|---|---|---|---|---|
| 2-4-6-8 | 2-5-7-9 | 1-3-4-8 | 1-4-5-6-9 | 1-5-6-9 | 3-4-5-6-9 | 1-2-5-6-9 | 1-2-3-5-8 | 2-3-4-8 | 3-4-9 |
| plus or minus | minus or plus | minutes primes | divisor ended | factor ended | exponent ended | radical ended | macron | breve seconds | fraction ended |

The ... of ... letter ... of letters and ... in the Standard Dot System, based upon the number of letters required for the full spelling of the 48,203 words given in Appendix C, aggregating 221,787 letters.

| Dot Numbers | Total Recurrence | Part Word | Part Word Recurrence | Whole Word | Whole Word Recurrence |
|---|---|---|---|---|---|
| 1-5 | 6.940% | | 5.015% | the | 1.934% |
| 2-3-4-5 | 3.613% | t | 3.023% | to | .590% |
| 2- | 4.556% | a | 1.105% | a | .451% |
| 1- | .982% | v | .944% | some | .038% |
| 1-2-3-3 | .305% | i | 3.253% | I | .050% |
| 1-2-3-3 | .295% | l | .277% | little | .018% |
| 1-2-3-5 | .789% | r | 2.739% | their | .050% |
| 1-4-5 | .565% | o | 2.548% | could | .015% |
| 1-3-5 | .518% | | 2.548% | | |
| 1-2-3-4 | .201% | m | 1.161% | made | .040% |
| 1-3-4 | .820% | b | 1.801% | people | .019% |
| 1-3-6 | .715% | d | 1.687% | under | .028% |
| 1-1-5 | .718% | d | 1.663% | would | .050% |
| 1-1-5 | .642% | a | 1.541% | not | .101% |
| 1-3-4-5-6 | .478% | s | 1.294% | by | .184% |
| 1-2-5 | .129% | h | 1.358% | had | .071% |
| 1-3 | .128% | 4 | 1.72% | of | .956% |
| 1-2-4 | .376% | i | 1.125% | for | .251% |
| 1-2-6 | .365% | er | 1.281% | were | .084% |
| 1-2-1-5 | .126% | g | 1.104% | great | .022% |
| 1-1-5-6 | .119% | in | .636% | in | .483% |
| 1-5-6 | .050% | ch | .952% | been | .098% |
| 2-4-5-6 | .994% | w | .58% | will | .156% |
| 2-4-5-6 | .967% | on | .782% | on | .185% |
| 2-3-4-5-6 | .935% | ed | .935% | | |
| 2-4-6 | .868% | es | .846% | yesterday | .022% |
| 1-2-3-6 | .797% | y | .687% | have | .110% |
| 1-2-5-6 | .764% | th | .497% | that | .267% |
| 1-2-4-6 | .747% | ar | .651% | are | .096% |
| 1-2-3-4-6 | .710% | and | .092% | and | .618% |
| 1-2-3-4-6 | .684% | b | .624% | but | .060% |
| 2-3-4-6 | .660% | an | .582% | an | .078% |
| 1-2-3-5-6 | .639% | is | .350% | is | .289% |
| 1-2-3-4-5-6 | .639% | or | .583% | or | .056% |
|  | 69.810% | | | | |

| Dot Numbers | Total Recurrence | Part Word | Part Word Recurrence | Word | What Word Recurrence |
|---|---|---|---|---|---|
| 3-4-6 | .613% | ing | .613% | be | .187% |
| 2-4-7 | .521% | be | .388% | out | .045% |
| 1-2-1-5-6 | .517% | ou | .472% | which | .101% |
| 2-3-4-5-6 | .509% | ch | .403% | it | .195% |
| 1-3-4-6 | .346% | x | .151% | has | .101% |
| 2-4-5 | .338% | j | .231% | | |
| 1-4-6 | .321% | tion | .321% | | |
| 1-2-5-7-8 | .230% | was | .012% | was | .218% |
| 1-3-5-6 | .180% | z | .046% | as | .131% |
| 1-2-3-1-5 | .166% | q | .069% | this | .087% |
| 1-2-5-7 | .156% | his | .012% | his | .144% |
| 2-4-5-7 | .151% | with | .025% | with | .126% |
| 2-1-5-7 | .131% | all | .069% | all | .065% |
| 1-2-4-7-8 | .129% | day | .108% | day | .021% |
| 1-2-4-8 | .110% | from | | from | .110% |
| 1-5-7-8 | .102% | who | .027% | who | .073% |
| 1-4-5-8 | .093% | do | .068% | do | .025% |
| 2-5-7 | .077% | work | .044% | work | .035% |
| 1-4-7 | .073% | other | .036% | other | .037% |
| 2-4-7-8 | .068% | over | .036% | over | .032% |
| 1-4-5-7 | .066% | year | .038% | year | .028% |
| 2-4-5-8 | .060% | when | .038% | when | .028% |
| 1-4-8 | .059% | there | .004% | there | .055% |
| 2-4-7 | .058% | after | .017% | after | .041% |
| 2-4-5-7-8 | .047% | time | .010% | time | .057% |
| 2-4-8 | .037% | last | .003% | last | .034% |
| 1-2-4-5-7 | .032% | about | | about | .032% |
| 1-2-4-5-8 | .032% | more | | more | .032% |
| 1-2-5-8 | .030% | said | | said | .030% |
| 1-4-5-7-6 | .027% | what | .003% | what | .024% |
| 1-5-7 | .023% | before | .001% | before | .023% |
| 2-5-7-8 | .023% | first | | first | .022% |
| 1-4-7-8 | .023% | until | | until | .023% |
|  |  | | 60.154% | | 9.656% |

For condensed estimate of the Standard Dot System, see page 10.    For time and accuracy values see Appendix B.

# APPENDIX G

## KEY TO THE IDEAL INDEPENDENT SYSTEM

**Note.**—The following possible general revision of the foregoing assignments is based primarily upon the maximum of legibility of the test and the relative frequency of recurrence of the letters, letter-groups, etc., assigned to the several characters, and has been prepared and is here submitted for purposes of comparison illustrating the greater speed and accuracy with which such an independent system might be read, together with other minor advantages that might be secured by the adoption of a general revision of the alphabet and numerals as well as of the current British Braille contractions.

ALPHABET --   1-2 a,   1-3-4-5-6 b,   1-4 c,   1-4-5 d,   1-5 e,   1-3 f,   1-5-6 g,   1-2-6 h,   2-4 i,   1-2-3-4-5-6 j,   1-2-3-5 k,   2-3-4-5 l,   1-3-4 m,   1-2-4-5 n,   1-2-5-6 o,   1-3-5 p,   1-2-3-4-5 q,   2-3-4 r,   1-2-3 s,   1 t,   1-3-6 u,   1-2-5 v,   3-4-5-6 w,   2-3-4-5-6 x,   1-2-4 y,   1-3-5-6 z,

NUMERALS --   (1-2) 1,   (1-4) 2,   (2-4-5) 3,   (1-4-5) 4,   (1-5) 5,   (1-2-4) 6,   (1-2-4-5) 7,   (1-2-5) 8,   (2-4) 9,   (1) 0,   (3-6) Numeral prefix.

MARKS OF PUNCTUATION, ETC. --   dot 3, capital prefix and comma, 3-9 whole-word capital prefix,   2-3 italic prefix and period, 2-5 colon and small-capital prefix,   3-5 semicolon and acute accent, 2-5-6 apostrophe,   2 hyphen,   3-6-9 dash,   2-6 interrogation point and grave accent,   2-3-5 exclamation point, tilde prefix, and circumflex accent,   2-3-5-6   2-3-5-6 marks of parenthesis,   3-5-6   3-5-6 brackets,   2-3-6   2-3-6 quotation marks.   2-3-6-9   2-3-6-9 interior quotation marks,   2-6-8 asterisk,

3-5-9 caret,   1-6 diaresis and umlaut prefix,   2-3-4-5-8 macron,   1-2-3-5-8 breve,   2-5-9 cedilla with letter c,   1-2-4-6-8 & (ampersand).

PART-WORD CONTRACTIONS --   2-4-5-6 an,   1-2-4-6 and,   1-3-4-5 ar,   1-2-3-5-6 ch,   2-4-6 ed,   1-2-3-6 en,   2-4-5 er,   1-2-3-4 es,   1-4-5-6 in,   3-4-6 ing,   1-3-4-6 is,   3-4-5 on,   1-2-3-4-6 or,   1-2-4-5-6 ou,   2-3-4-6 th,   1-4-6 tion.

WHOLE-WORD CONTRACTIONS --   2-4-5-6 an,   1-2-4-6 and,   1-3-4-5 are,   1-3-5-6 as,   1-2-3-6 been,   1-3-4-5-6 but,   1-2-4 by,   1-4 could,   1-5 every,   1-3 for,   1-5-6 great,   1-2-3-5 had,   1-2-3-4-5-6 has,   1-2-6 have,   1-4-5-6 in,   1-3-4-6 is,   2-3-4-5-6 it,   2-3-4-5 little,   1-3-4 made,   1-2-4-5 not,   1-2-5 of,   3-4-5 on,   1-2-3-4-6 or,   1-2-4-5-6 out,   1-3-5 people,   1-2-3 some,   2-3-4-6 that,   1 the,   2-3-4 their,   1-2-3-4-5 this,   1-3-6 under,   2-4-5 were,   1-2-3-5-6 which,   3-4-5-6 will,   1-4-5 would.

THIRD-BASE CONTRACTIONS-- ⠴ 1-2-4-5-7 about, ⠠ 1-2-4-7 after,
⠄ 1-5-7-8 all, ⠦ 1-2-5-7-8 be, ⠐ 1-5-7 before, ⠰ 1-4-5-8 day,
⠄ 2-5-7-8 first, ⠠ 8-5-7 from, ⠠ 1-2-4-8 his, ⠄ 2-4-8 last,
⠦ 1-2-4-5-8 more, ⠄ 2-4-5-7 other, ⠄ 2-4-7-8 over, ⠄ 1-2-5-8 said,
⠄ 1-4-8 there, ⠄ 2-4-5-7-8 time, ⠄ 2-4-7 to, ⠄ 1-4-7-8 until,
⠄ 1-5-8 was, ⠦ 1-4-5-7-8 what, ⠄ 2-4-5-8 when, ⠄ 1-4-7 who,
⠄ 1-2-4-7-8 with, ⠄ 1-2-5-7 work, ⠄ 1-4-5-7 year.

The *percentages of non-conflicting recurrence* of letters and contractions in the *Ideal Independent System*, based upon the number of letters required for the full spelling of the 48,203 words given in Appendix C, aggregating 221,787 letters.

| Dot Numbers | Total Recurrence | Part Word | Part Word Recurrence | Whole Word | Whole Word Recurrence | Dot Numbers | Total Recurrence | Part Word | Part Word Recurrence | Whole Word | Whole Word Recurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.751% | t | 4.817% | the | 1.934% | 3-4-6 | .613% | ing | .613% | had | .071% |
| 1-5 | 5.015% | e | 4.998% | every | .017% | 1-2-3-5 | .543% | k | .472% | be | .183% |
| 1-2 | 4.556% | a | 4.105% | a | .451% | 1-2-3-7-8 | .521% | be | .338% | ou | .045% |
| 1-2-3 | 3.982% | s | 3.944% | some | .038% | 1-2-4-5-6 | .517% | ou | .472% | which | .101% |
| 2-4 | 3.303% | i | 3.253% | I | .050% | 1-2-3-5-6 | .501% | ch | .403% | it | .195% |
| 2-3-4-5 | 3.295% | l | 3.277% | little | .018% | 2-3-4-5-6 | .346% | x | .151% | | |
| 2-3-4 | 2.789% | r | 2.739% | their | .050% | 1-4-6 | .321% | tion | .321% | | |
| 1-4 | 2.563% | c | 2.518% | could | .015% | 1-2-3-4-5-6 | .338% | j | .234% | has | .104% |
| 1-2-5-6 | 2.413% | o | 2.413% | O | | 1-4-5-7 | .313% | year | .038% | year | .275% |
| 1-3-4 | 2.201% | m | 2.161% | made | .040% | 1-5-8 | .230% | was | .012% | was | .218% |
| 1-3-5 | 1.820% | p | 1.801% | people | .019% | 1-3-5-6 | .180% | z | .046% | as | .134% |
| 1-4-5 | 1.806% | d | 1.756% | would | .050% | 1-2-3-4-5 | .166% | q | .069% | this | .097% |
| 1-3-6 | 1.715% | u | 1.687% | under | .028% | 1-2-4-8 | .156% | his | .012% | his | .144% |
| 1-2-4-5 | 1.612% | n | 1.541% | not | .101% | 1-1-5-8 | .151% | day | .130% | day | .021% |
| 1-2-5 | 1.626% | v | .670% | of | .956% | 1-2-4-7-8 | .151% | with | .025% | with | .126% |
| 1-2-4 | 1.483% | y | 1.299% | by | .184% | 1-3-7-5 | .134% | all | .069% | all | .065% |
| 1-2-6 | 1.429% | h | 1.319% | have | .110% | 2-5-7 | .110% | from | | from | .110% |
| 1-3 | 1.376% | f | 1.125% | for | .251% | 2-5-8 | .102% | who | .027% | who | .075% |
| 2-4-5 | 1.370% | er | 1.286% | were | .084% | 2-4-5-7 | .077% | work | .044% | work | .033% |
| 1-5-6 | 1.126% | g | 1.104% | great | .022% | 2-4-7-8 | .073% | other | .036% | other | .037% |
| 1-4-5-6 | 1.119% | in | .636% | in | .483% | 2-4-5-8 | .068% | over | .036% | over | .032% |
| 1-2-3-6 | 1.050% | en | .952% | been | .098% | 1-4-8 | .060% | when | | when | .060% |
| 3-1-5-6 | .991% | w | .838% | will | .156% | 1-2-4-7 | .059% | there | .004% | there | .055% |
| 3-1-5 | .967% | on | .782% | on | .185% | 1-2-4-7 | .058% | after | .017% | after | .041% |
| 2-4-6 | .935% | ed | .935% | | | 2-4-5-7-8 | .047% | time | .010% | time | .037% |
| 1-2-3-4 | .868% | es | .868% | | | 1-2-4-8 | .037% | last | .003% | last | .034% |
| 2-4-7 | .818% | to | .228% | to | .590% | 1-2-4-5-7 | .032% | about | | about | .032% |
| 2-3-4-6 | .761% | th | .497% | that | .267% | 1-2-4-5-8 | .032% | more | | more | .032% |
| 1-3-4-5 | .747% | ar | .651% | are | .096% | 1-2-5-8 | .030% | said | | said | .030% |
| 1-2-4-6 | .710% | and | .092% | and | .618% | 1-1-5-7-8 | .027% | what | .003% | what | .021% |
| 1-3-4-5-6 | .651% | b | .621% | but | .060% | 1-5-7 | .023% | before | | before | .023% |
| 2-4-5-6 | .660% | an | .582% | an | .078% | 2-5-7-8 | .023% | first | .001% | first | .022% |
| 1-3-1-6 | .639% | is | .350% | is | .289% | 1-4-7-8 | .023% | until | | until | .023% |
| 1-2-3-1-6 | .639% | or | .583% | or | .056% | | | | | | |
| | 69.920% | | 60.047% | | | | | | 60.047% | | 9.873% |

For condensed estimate of the Ideal Independent System, see page 10.  For time and accuracy values see Appendix B.

# APPENDIX H

The *percentages* of *non-conflicting recurrence* of letters and contractions in the *British Braille System*, based upon the number of letters required for the full spelling of the 48,203 words given in Appendix C, aggregating 221,787 letters.

| Part Word | | Whole Word | | Part Word | | Whole Word | | Part Word | | Whole Word | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | 4.657 | a | .4520 | | | by | .1840 | | | upon | .0210 |
| b | .846 | but | .0610 | | | his | .1450 | | | unto | |
| c | 2.102 | can | .0230 | ch | .398 | child | .0050 | work | .013 | work | .0340 |
| d | 1.717 | do | .0250 | gh | .130 | | | word | .0036 | word | .0027 |
| e | 5.173 | every | .0180 | sh | .252 | shall | .0068 | world | .0014 | world | .0077 |
| f | 1.019 | from | .1150 | th | .352 | this | .0980 | young | .0032 | young | .0100 |
| g | .846 | go | .0086 | wh | .252 | which | .1020 | there | .0050 | there | .0560 |
| h | .775 | have | .1100 | ed | .935 | | | | | these | .0230 |
| i | 3.585 | I | .0510 | er | 1.079 | | | | | | |
| j | .219 | just | .0150 | ou | .492 | out | .0460 | character | .0023 | their | .0500 |
| k | .470 | knowledge | .0004 | ow | .221 | | | through | .0027 | character | .0009 |
| l | 3.483 | like | .0110 | ea | .477 | | | | | through | .0200 |
| m | 1.880 | more | .0330 | com | .161 | | | | | those | .0110 |
| n | 2.280 | not | .1010 | con | .184 | | | where | .0027 | where | .0210 |
| o | 3.228 | | | en | 1.085 | enough | .0064 | | | whose | .0064 |
| p | 1.750 | people | .0200 | | | | | ought | .022 | ought | .0014 |
| q | .065 | quite | .0041 | dis | .063 | | | ound | .056 | | |
| r | 3.662 | rather | .0023 | st | .623 | still | .0064 | ance | 037 | | |
| s | 4.450 | so | .0320 | ing | .613 | | | ence | .048 | | |
| t | 3.703 | that | .2680 | ar | .607 | | | ble | .070 | | |
| u | 1.559 | us | .0041 | | | cannot | .0041 | | | many | .0230 |
| v | .663 | very | .0140 | day | .130 | day | .0210 | ful | .029 | | |
| | | | | ever | .050 | ever | .0130 | ong | .064 | | |
| w | .582 | will | .1570 | father | .0004 | father | .0068 | sion | .037 | | |
| x | .151 | it | .1950 | here | .086 | here | .0160 | tion | .321 | | |
| y | 1.198 | you | .0120 | | | had | .0710 | ation | .164 | | |
| z | .046 | as | .1340 | know | .013 | know | .0090 | less | .013 | less | .0080 |
| and | .092 | and | .6180 | lord | .0004 | lord | .0050 | ness | .030 | | |
| for | .092 | for | .2510 | mother | .0018 | mother | .0077 | ount | .018 | | |
| of | .061 | of | .9570 | name | .0045 | name | .0095 | ment | .101 | | |
| the | .157 | the | 1.9350 | one | .042 | one | .0520 | ity | .078 | | |
| with | .026 | with | .1260 | part | .010 | part | .0120 | ally | .026 | | |
| be | .023 | be | .1830 | right | .0068 | right | .0055 | | | Christ | .0000 |
| | | to | .5900 | some | .015 | some | .0380 | | | Jesus | .0000 |
| | | were | .0840 | spirit | .0064 | | | | | God | .0000 |
| in | .637 | in | .4830 | time | .010 | time | .0370 | | | | |
| | | was | .2190 | under | .0082 | under | .0290 | 89 | 60.6534 | 80 | 8.5448 |

For condensed estimate of the British Braille System, see page 10.
For time and accuracy values, see Appendix B.

The *percentages* of *non-conflicting recurrence* of letters and contractions in the *American Braille System*, based upon the number of letters required for the full spelling of the 18,203 words given in Appendix C, aggregating 221,787 letters.

| Part Word | | Whole Word | | Part Word | | Whole Word | | Part Word | | Whole Word | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | 4.91% | a | .45% | s | 4 23% | should | .01% | ing | .61% | | |
| b | 1.49% | but | .06% | t | 4.42% | the | 1.93% | is | .90% | is | .29% |
| c | 2.54% | could | .02% | u | 1.69% | under | .03% | of | .06% | of | .96% |
| d | 1.95% | down | .01% | v | .75% | very | .01% | on | .97% | on | .19% |
| e | 7.15% | | | w | .93% | will | .16% | or | .64% | or | ..06% |
| f | 1.06% | from | .11% | x | .15% | | | ou | .53% | | |
| g | 1.10% | great | .02% | y | 1.69% | you | .01% | ow | .22% | | |
| h | .58% | have | .11% | z | .05% | | | st | .62% | | |
| i | 2.79% | I | .05% | an | .61% | an | .08% | th | .75% | that | .27% |
| j | .23% | just | .01% | and | .09% | and | .62% | | | their | .05% |
| k | .54% | know | .01% | ar | .78% | | | | | | |
| l | 3.64% | like | .01% | ch | .41% | | | tion | .32% | | |
| m | 2.32% | my | .01% | ed | .94% | | | | | to | .59% |
| n | .88% | not | .10% | en | 1.11% | | | | | was | .22% |
| o | 2.45% | | | er | 1.55% | | | wh | .28% | which | .10% |
| p | 1.84% | | | for | .09% | for | .25% | | | with | .13% |
| q | .06% | quite | .01% | | | had | .07% | | | would | .05% |
| r | 2.85% | right | .01% | in | 1.12% | in | .48% | 46 | 64.89% | 37 | 7.55% |

For condensed estimate of the American Braille System see page 10.
For time and accuracy values, see Appendix B.

# Appendix J

The *percentages of non-conflicting recurrence* of letters and contractions in the *New York Point System*, based upon the number of letters required for the full spelling of the 48,203 words given in Appendix C, aggregating 221,787 letters.

| Part Word | | Whole Word | | Part Word | | Whole Word | | Part Word | | Whole Word | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | 6.68% | a | .45% | n | 5.75% | not | .10% | and | .09% | and | .62% |
| b | 1.49% | but | .06% | o | 5.62% | O | | the | .30% | the | 1.93% |
| c | 2.54% | can | .02% | p | 1.79% | part | .01% | | | that | .27% |
| d | 2.97% | | | q | .07% | | | of | .06% | of | .96% |
| e | 10.60% | | | r | 6.12% | | | ch | .39% | change | 01% |
| f | 1.17% | for | .25% | s | 5.97% | some | .04% | gh | .19% | | |
| g | .91% | great | .02% | t | 5.95% | | | ph | .04% | | |
| h | 1.11% | had | .07% | u | 1.70% | under | .03% | sh | .26% | | |
| i | 6.10% | I | .05% | v | .86% | very | .01% | th | .64% | | |
| j | .22% | just | .01% | w | 1.34% | will | .16% | wh | .28% | which | .10% |
| k | .54% | kind | .01% | x | .15% | | | ou | .60% | | |
| l | 2.73% | | | y | 1.69% | you | .01% | ing | .61% | | |
| m | 2.40% | | | z | .05% | | | 37 | 79.98% | 23 | 5.19% |

For condensed estimate of the New York Point System see page 10.

For time and accuracy values, see Appendix B.

# Appendix K

## SUGGESTIONS TO WRITERS AND PRINTERS OF THE STANDARD DOT SYSTEM

The assignment of primary and secondary representative values of the several characters has been so made as to obviate the necessity of any extended rules for determining the places where, or the ways in which the several symbols may be employed, beyond the current rules of ordinary visual composition. The method of writing will necessarily vary with the apparatus used. With the Standard Dot variable-base tablet, most of the letters of the alphabet and the other second-base characters may require to be written wholly in one cell, or partly in one cell and partly in the next, according as the preceding space ends before or within the cell in which the character to be written begins. But in all cases a new character in the same line should be begun upon the same side of its proper cell as that on which the preceding character ended.

Primary reading and spelling books for the use of young pupils in the lower elementary grades may be printed in full orthography, but in other school text-books and miscellaneous reading matter, the contractions should be employed. All readers should be expected to familiarize themselves with the standard contractions and employ them in their written exercises. The letter-groups which these severally represent have been so assigned as to reduce to the minimum the liability to leave the reader in doubt as to the spelling of the words for which or in which they are employed.

### Intervals, Syllabication, Arrangement, Etc.

To promote speed and accuracy in reading and minimize the fatigue involved, the embossed dots should be well rounded, evenly and moderately elevated, and distinctly expressed upon sheets of firm texture and convenient size; and the distance between the dots should be neither too great nor too small for quick and accurate perception. We believe .090 of an inch, or approximately 2.25 millimeters to be about the best distance from center to center of the dots, both vertically and horizontally, for general use. The successive lines of the text should be more widely separated than are the upper and lower dots (1 and 3, 4 and 6, 7 and 9) of the characters; about .210 of an inch (5.25 millimeters) from the lower dot in one line to the upper dot in the line below (measured from centre to centre) being believed to yield about the best interlineal separation—thus assigning .39 of an inch (1 centimeter) of column height to each line of reading matter.

A blank space, one point unit in width, should be left between the successive characters of a word and between a word and its associated punctuation and diacritical marks. An interval three point units in width should be left between the successive words of a sentence standing upon the same line. A space four point units in width should be left blank at the beginning of the first line of a paragraph; and when one sentence ends and another sentence begins upon the same line, a like interval should be left between such sentences. And if stanzas or other divisions of verse are written in prose paragraph form, the successive lines of the poem ending in mid-line should be separated by intervals six point units in length, except when beginning at the left margin of the page. But when practicable, the ordinary visual arrangement of poetry upon the page is greatly to be preferred, even at some sacrifice of space and printer's stock. The arrangement of page captions and other headings and the numbering of volumes, chapters, pages and other textual features should, as far as practicable, be made to conform to the approved rules and usages of accurate literary composition. In the literature to be embossed in the new Standard Dot System, completeness of text, accuracy and legibility should be made the leading considerations, the saving of space and expense being carefully subordinated to these chief prerequisites in reading matter for the blind.

Distinct words should not be blended by juxtaposition like successive letters of the same word; and successive syllables should not be blended by the use of contractions denoting parts of two different syllables. (Some authorities hold that a letter-group sign should not be employed for part of a syllable when one of the letters that would be so represented is doubled within the same syllable, as in *seen*, *deer*, *miss*, *soon*, *door*, etc.) Whenever ambiguity or hesitation would probably result from the employment of an authorized contraction, the word to be represented should not be so contracted unless currently and similarly abbreviated in visual composition. All embossing printers should be strictly enjoined to pay due heed to approved literary standards in the matters of capitalization, punctuation, syllabication, spacing, arrangement upon the page, and other details of typographical taste and accuracy.

# APPENDIX L

## KEY TO SUGGESTED STANDARD DOT MUSICAL NOTATION

In formulating the Standard Dot System of Music, an effort has been made to retain as far as possible the usual Braille forms and only such assignments have been changed as were necessary to destroy ambiguity, to supply regular signs in places where special provisions were formally necessary, and to substitute simple third-base signs for two-cell, or double character signs.

In the system herewith set forth no assignments have been made for organ, vocal, or small instrument music; but there still remains an abundance of unassigned symbols to meet all possible needs along these lines.

The general rules governing the use of The Standard Dot Musical Notation do not necessarily differ from the rules governing the use of the existing punctographic systems of music.

NOTES.—The seven notes of the diatonic scale given in ascending order beginning with C are represented by the following characters:

*Whole notes*

*Half notes*

*Quarter notes*

*Eighth notes*

*Sixteenth notes*

*Thirty-second notes*

*Sixty-fourth notes*

*One hundred and twenty-eighth notes*

RESTS

| Whole | Half | Quarter | Eighth | Sixteenth | Thirty-Second | Sixty-fourth |
| --- | --- | --- | --- | --- | --- | --- |

DOT . (3) double dots ..

OCTAVE MARKS—

In The Standard Dot Musical Notation the octave begins with C and ends with B, the first octave being founded on the lowest C on the piano. The octave signs should be placed before the finger signs, and

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are formed by adding dot 8 to the seven digits used for notes, placed in the lower level. For A and P below the first octave, dot 9 is added to the first octave sign ⠄⠆

First       Second      Third       Fourth      Fifth       Sixth       Seventh     Eighth
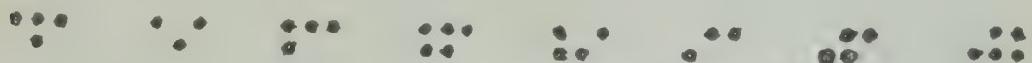
## FINGER SIGNS—

First       Second      Third       Fourth      Fifth

Finger signs should immediately precede the note or accidental affecting it.

## INTERVALS—

The interval sign immediately follows the note or dotted note, and is reckoned upwards from the written note.

## INTERVAL SIGNS—

First       Second      Third       Fourth      Fifth       Sixth       Seventh     Eighth

## RIGHT HAND SIGN—MD

## LEFT HAND SIGN—MG

These signs should appear at the beginning of each paragraph together with the number of the paragraph.

## SEPARATIONS—

A bar is indicated by an ordinary word-space; and a double bar by the sign ⠒⠒⠂

MUSICAL HYPHEN-- • dot 2.

WORD SIGN -- .:

WORD RELEASE -- . dot 3. This sign should follow all literary values.

IN ACCORD WITH SIGN -- ·.

REPEAT MARKS --

    Beginning of repeat - :::, to mark beginning of count for repeat.

    For measure or half measure - ::

    For a group, note, chord, or rest - :

ACCIDENTALS --

| Sharp :: | Double sharp :: :: |
|----------|---------------------|
| Flat :. | Double flat :. :. |
| Natural . | |

Accidentals are placed immediately preceding the note or interval affected
by them.

KEY SIGNATURE --

    The usual Braille method of expressing key signature is retained.

    One sharp ::

    Two flats :. :.

    Three sharps :: :: ::

    Four flats .. :: :.

RYTHMICAL SIGNATURE --

    $\frac{4}{4}$ (four four time) is written .. :· ·:

    $\frac{6}{8}$ (six eight time) is written .. ·: :.

METRONOME MARKS --

    60 whole notes to a minute would be expressed by

        C(whole note) = sixty

EMBELLISHMENTS --

Appoggiatura    ⠄⠄

Long appogiatura    ⠄⠄⠄

Trill        ⠒⠄

Upper mordant   ⠄⠒⠄

Lower mordant    ⠄⠒⠄

Extended upper mordant   ⠄⠄⠄

Extended lower mordant  ⠄⠄⠄

Arpeggio    ⠄⠒⠄

Arpeggio continued from left hand   ⠄⠒⠄

Turn played after note     ⠄⠒

Turn played before the note    ⠄⠄⠒

      An accidental sign placed before a turn refers to its upper note;
if ⠒⠄  2-3-5-9 precedes the accidental it refers to the lower note of the
turn.  When two accidentals are placed before a turn, the first applies to
the upper note and the second to the lower note of the turn.

MARKS OF EXPRESSION --

Staccato  ⠒⠄

Sharp staccato  ⠄⠒⠄

Semi staccato   ⠒⠄⠄

Tenuto   ⠄⠒⠄

Accent   ⠒⠄⠄

Martellato  ⠒⠄⠄

Pause    ⠄⠒⠄

Swell or crescendo and diminuendo on the same note   ⠄⠒⠄

SLUR --

Short slur ´´

Beginning of long slur ⠠⠦

End of long slur ⠴⠄

Junoture of two short slurs on one note ⠐⠦

Junoture of two long slurs on one note ⠐⠦

Junoture of two short slurs between notes ⠦⠂

Junoture of two long slurs between notes ⠠⠦⠂

When two long slurs begin on the same note and end on different notes,
use the sign ⠠⠦ ⠠⠦ and at the end of the first one, use ⠐⠆ and at the
end of the second one, use ⠠⠦

TIE SIGN-- ⠐⠆´

PEDAL SIGN-- ⠠⠐

PEDAL RELEASE-- ⠐⠄

TRIPLET SIGN-- ⠰⠄

TRIPLET DISCONTINUED-- ⠰⠂

QUINTOLES -- ⠱ Followed by number in lower part of the cell as four
notes in group ⠂⠄⠆

MELODY SIGN -- ⠨⠆

MUSIC SIGN -- ⠐⠆ This is to be used in literary text where an illustration
of music occurs.

DISCONTINUANCE OF MUSIC SIGN -- ⠒⠂

PRO FORMA -- ⠂⠆

TREMOLO -- ⠆⠐

Crescendo, diminuendo, piano, forte, etc. may be expressed by the use of
the word-sign before the usual ink-print initial abbreviation, followed by
the "Word-release". The "Release" sign should follow all abbreviations
whether of one letter or more.